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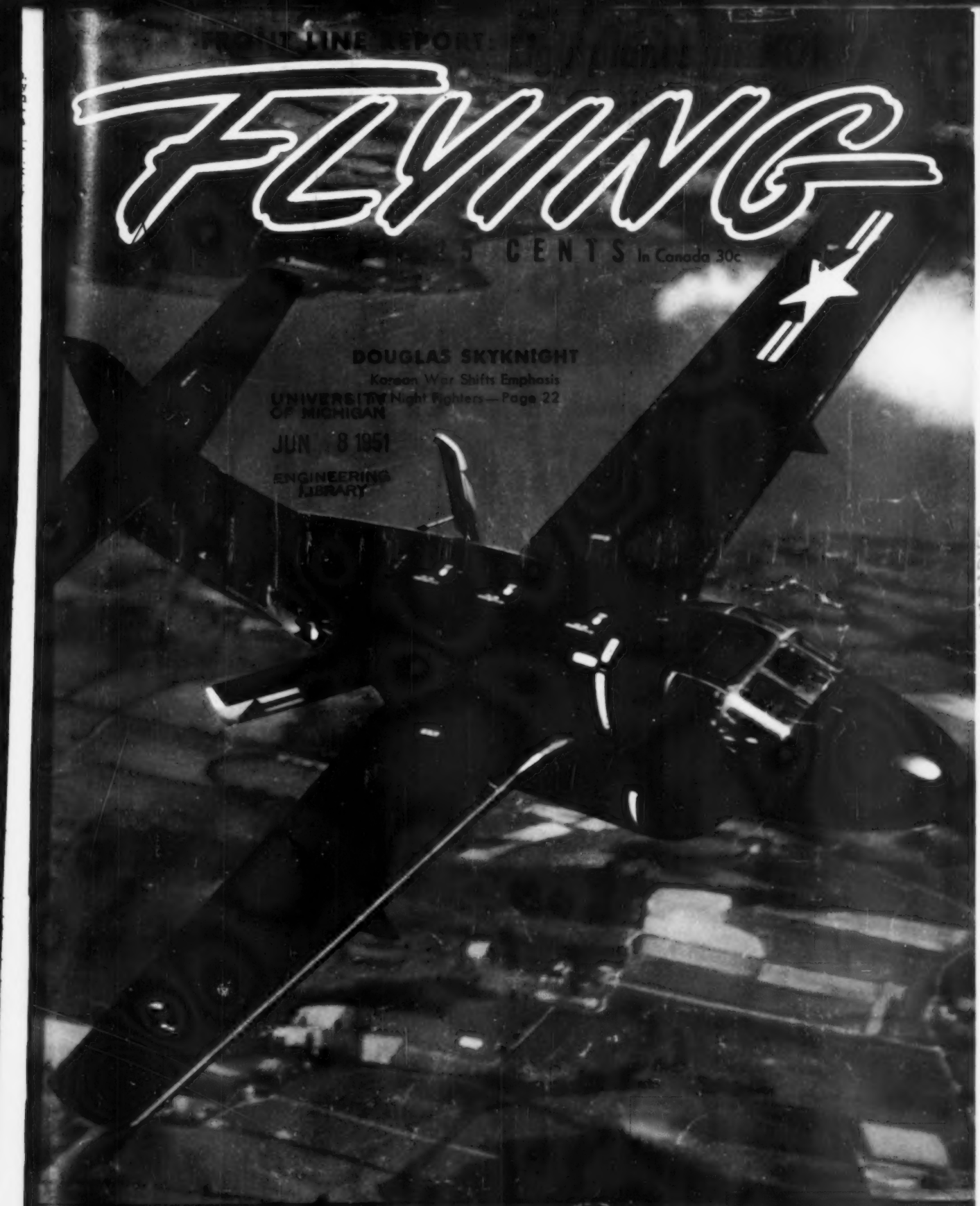

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COVER: Douglas F3D Skyknight is first Navy fighter specifically designed for night operation. (Details on page 22.)

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JULY • 1951

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Here's the biggest news in private flying since the first Cub flew 20 years ago. Piper, leading builder of business, farm and personal planes, now brings you the sensational new Tri-Pacer, which makes flying so simple an eight-year-old girl learned to take off and land in six short lessons!

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NOTES ON CIVIL FLYING

New Narco 'Omnihomer'

Narco "Omnihomer" is new 8½-pound set that includes VHF receiver and transmitter with omni-directional range navigation equipment. The set is 5¼x6⅞x 10¼ inches and can be integrally mounted on the instrument panel. The panel includes tuning crank, transmitter-frequency selector, course-selector, and a left-right meter for omni navigation. The transmitter operates on four channels from 121.5 to 122.9 mcs.

Piper's Ag Plane

Piper agricultural *Cub*, now in production at Lock Haven, Pa., can carry half a ton of chemicals for dusting or spraying. Chemicals are carried in large bin or tank behind the pilot's seat. As duster, it has dispensing device under the hopper which uses the venturi system of sucking out the dust and dispersing it out-

ward in a 40-foot wide swath. When fitted as sprayer, two pipes are mounted on outriggers under the wings. Pipe has 24 nozzles through which liquid chemical is atomized under high pressure and dispensed. It can be operated at gross weight of 2,000 pounds under provisions of Part 8 of the CAR for special purpose flying such as crop dusting and spraying. The plane is essentially a *Super Cub* fitted with a Lycoming 125-h.p. engine and with flaps.

Stronger Seats for Safety

Aircraft seats should be 50 per cent stronger, recommends the Airworthiness Division of the International Civil Aviation Organization. They should be able to withstand an acceleration nine times that of gravity to improve passenger protection in event of forced landings, ICAO says. Present standards call for a minimum of six times the acceleration of gravity in a forward direction.

CAA Lists Alaska Resorts

Pilots can get a list of Alaskan resorts accessible only by airplane by writing CAA Office of Aviation Information, Washington, 25, D. C., or by contacting CAA regional offices.

The list gives the location of the resorts, tells what facilities are available for planes, and indicates accommodations, prices charged and special attractions to visitors. Rates vary widely. In some places only a ranger's cabin exists and vacationers must bring all supplies. Some deluxe accommodations, says CAA, are $25 per day—but this rate "includes camp facilities, room, board and boats."

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Pilots' Association as "The girl I would most like to have in my plane when I turn on my autopilot."

over an officially-certified straightaway 16-kilometer course at an average speed of 469 m.p.h. Miss Cochran holds five of the seven recognized world speed records for different distances in the open class for prop-driven planes.

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Smallest Gas Turbine

Recent orders for the world's smallest gas turbine engine total over $5,000,000, says AiResearch Manufacturing Company. Two versions of the turbine are now in production, one producing compressed air equivalent to 65 h.p., the other producing up to 84 shaft horsepower. Units are about the size of a hand valise and weigh between 150 and 175 pounds. They are used for auxiliary power in late planes and as portable ground sources by the Navy and Air Force.

AiResearch says that with some modification the turbine might be used to power small aircraft; however, this application is not contemplated at present.

Nyrop to NACA

Donald W. Nyrop, new chairman of CAB and ex-Administrator of Civil Aeronautics, was recently appointed a member of the National Advisory Committee for Aeronautics. He succeeds Delos W. Rentzel, new Undersecretary of Commerce for Transportation.

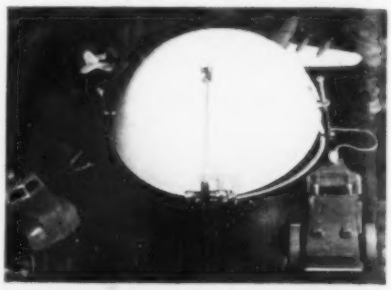
Aviation Employment Jumps

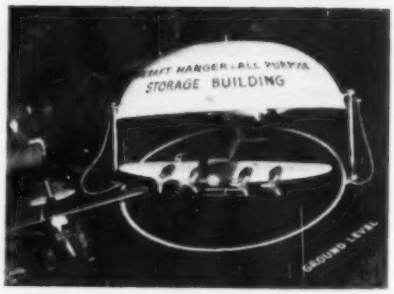
Over 100,000 new persons were employed in manufacturing aircraft and parts in the first six months after fighting began in Korea, says the U.S. Department of Labor. Employment in 81 establishments accounting for 90 per cent of the industry's employment increased about 25 per cent from September to January. A further increase of at least 20 per cent is expected by July.

Shapely Cleo Moore, an RKO starlet, has been unanimously elected by the Santa Monica, California, Pilots' Association as "The girl I would most like to have in my plane when I turn on my autopilot."

Igloo Hangar

Igloo-type hangar designed by Kenneth Arnold of Boise, Ida., may soon appear on market. It would be made of 16 tongue-and-grooved pie-shaped wedges of plywood or plastic material which would





fit together to form the completed building. Counterweight in rear would balance weight of hangar so that entire shell could be lifted easily on rear hinge to provide access to interior. Design would hug ground in windstorms, has further advantage of being easily transported and assembled.

Parts for Silvaire, Swift

Parts sales and service activities for Temco *Swift* and Luscombe *Silvaire* lightplanes have been consolidated into a single organization, operating as a section of the Luscombe Service Order Department with headquarters at the Luscombe plant in Garland, Tex. Temco and Luscombe plants have been converted completely to defense production.

National Soaring Contest

Three national championships (men's, women's and championship club) will be determined at the 18th National Soaring Contest being held this month (July 4-12) at Elmira, N. Y.

Another Record for Jacqueline

Jacqueline Cochran recently set a new world speed record for prop-driven planes when she piloted her F-51 *Mustang* over an officially-certified straightaway 16-kilometer course at an average speed of 469 m.p.h. Miss Cochran holds five of the seven recognized world speed records for different distances in the open class for prop-driven planes.

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● From airfield to airfield—coast to coast—the Sign of the Flying Red Horse means the best in flying performance and protection. Flying Red Horse products, Mobilgas Aircraft and Mobiloil Aero, are found at more U. S. airfields, both commercial and private, than those of any other oil company. They've earned the approval of aircraft engine builders—are approved against and surpass the rigid requirements of the Army and Navy. Why accept anything less for *your* plane?

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MILITARY NEWS

THE WAR IN KOREA

. . . **In the first 10 months** of the Korean war, the Communists lost 147 MIG-15's and 167 other aircraft, including YaK-9's, YaK-3's, IL-10's, LA-5's, and LA-7's.

. . . **Rescue helicopters** of the Third Air Rescue Squadron have twice gone to the aid of the 187th Regimental Combat Team after mass parachute jumps in the Korean war. Seven helicopters were assigned the mission of evacuating wounded and jump casualties just south of the 38th Parallel after the most recent drop. Said Capt. Harry Copsey, who set the first "chopper" down in a rice paddy 15 minutes after the jumpers hit the silk, "The North Koreans fled to the hills and began firing mortars and small arms. Despite all efforts, they continued sniping all day whenever we came in to get another load of patients."

. . . **Next move** in Korea, says Rear Adm. Allen E. Smith, commander of Task Force 77, may be the use of guided missiles by the Navy for interdiction shelling.

HERE AT HOME

. . . **How many planes** in an Air Force group? The number varies according to the group's function, as follows: tactical fighter-bomber groups, 75; day interceptor groups, 75; all-weather interceptor groups, 36; tactical reconnaissance groups, 54; strategic reconnaissance groups, 30; troop carrier groups, 36 or 48; heavy bomber groups, 30; medium bomber groups 35 (also, in some cases, 20 tankers for flight refuelling); light bomber groups, 48.

. . . **Battle-tested** North American F-51 will be used in training by the Air Force. Texas Engineering and Manufacturing Company will build a two-seat version of the famous Mustang for service as a single-engined advanced trainer. Second cockpit will be fully-equipped. Plane's designation: TF-51.

. . . **New official name** for North American's AJ-1 is "Savage." The name was chosen by Composite Squadron

VC-5, the first group to be assigned the heaviest U. S. carrier-based plane.

. . . **Air Force designation** for the English Electric Canberra, twin-jet light bomber that will be built in the U. S. by Martin, is B-57A.

. . . **Lockheed will build** trainer versions of the F-80 (T-33's and TO-2's) at a faster rate and in larger numbers than

any of its planes since the P-38 Lightning of World War II, says company president Robert E. Gross.

. . . **DeHavilland Beaver**, winner of recent evaluation tests for liaison aircraft held at Wright-Patterson Air Force Base, is designated the YL-20 by the military. Two Beavers, designated C-127's, are also being tested by the USAF as light transports.

New version of North American Sabre, the F-86D, powered by a GE J-47 turbojet with afterburner, recently completed rocket firing tests. The all-weather jet can carry 24 "Mighty Mouse" rockets which can be fired in various combinations, including salvo.

. . . **Consolidated Vultee** appears likely to be builder of the world's first atom-powered aircraft.

. . . **Top civil defense** officials say that any possible Russian air attack would come over the Polar region, that 15 to 20 American cities might be hit with A-Bombs at once in any air assault, and that the greatest threat is to cities in the northern half of the United States.

. . . **Orders** for Northrop F-89 Scorpion all-weather interceptor have been increased. The twin-jet Scorpions are now being produced in quantity on Northrop's production line at Hawthorne, Calif. Current models are armed with six 20-mm. cannon and are capable of operating at altitudes above 40,000 feet. It is in the "over 600-m.p.h." class.

FROM OTHER FRONTS

. . . **British journals** report that headquarters for Soviet jet fighters based in Germany is at Finow, near Eberswalde, north of Berlin. Says "Flight," a British aviation magazine: "Only MIG-15's have been identified. They are at present in great numbers at Finow, Oranienburg, Werneuchen, Doeberitz and Rangsdorf. The turbojets fitted are considered to be of axial type—not centrifugal, as popularly supposed. . . . The Russians are said to be diffident about operating their jets in anything but the best weather. Nevertheless, they recently flew MIG-15's by night from Staaken."

. . . **Eastern France** contains few airbases from which jets can operate, although Western Union forces have a number of jet airbases in the West German Republic. Russia is believed to have about 500 jet fighters in East Germany with a number of supporting medium bombers based in Czechoslovakia and Poland.

WHAT THEY SAY

. . . **Marshal of the RAF** Sir John Slessor, chief of the air staff, in disclosing that the RAF's new four-jet bombers could carry atomic bombs: "They are very expensive aircraft; they cost more than a destroyer used to cost in the old days. . . . These new heavies of ours with the atomic weapon will have an enormously superior striking power to anything we knew six years ago."

. . . **Maj. Gen. Emmett O'Donnell**, former head of the USAF bomber command in Korea, speaking of the safety record of B-29's in combat: "Eighty per cent of the flying crews are combat veterans of World War II. Missions are safe and successful because each B-29 that takes to the air carries in its 10- or 11-man crew a combined total of over 70 years' flying experience."

. . . **Capt. Robert Martin Jr.**, a B-26 pilot, when asked how he destroyed 14 North Korean trains: "Concentrate on the locomotive and hit it with .50-cal. stuff to stop it while its pressure is still up. Make the first pass broadside, firing for the boiler before the engineer can open the valve that releases the steam. The boiler blows up when punctured with machine gun fire. Once the train is stopped, make other passes."

FLYING
VOLUME 49, NO. 1
JULY, 1951

Defense planners are gambling that war won't come for two years. If they are right, our plane plants will be ready.

THE AIR FORCES TAKE A 'Calculated Risk'

By RICHARD E. SAUNDERS

UNITED STATES defense planners are gambling that war will not come for two years at least.

If they are right, they will end up with more planes tomorrow—but they will have fewer planes today.

If they are wrong, they might be caught in a full-fledged shooting war with their planes down.

It is no secret that the Joint Chiefs of Staff are not too happy about the new policy. Neither are some elements of the aircraft industry itself.

Last year the nation's aircraft industry produced approximately 37,000,000 pounds of military aircraft —only about 7,000,000 pounds more than the year before. Production this year will be more than doubled but will not approach the optimistic forecasts of some high Government officials, including President Truman.

The reasons always have been plain to production experts and always have been obscure to laymen who seem never to understand that you cannot turn airplane production on like a faucet by the simple expedient of appropriating money. The 9.6 billion dollars appropriated for Air Force and Naval aviation procurement for 1951 is about four times as much as was appropriated last year. But it is not going to produce four times as many airplanes—at least this year. The reason is lack of—TIME.

Because of the extraordinary length of time required to translate money into finished airplanes through such stages as building new production capacity for raw materials, new production capacity for aircraft, training men and engineers, and designing, testing, and scheduling aircraft, the defense planners of the country have embarked upon a course of considered risk.

They have decided to place more emphasis upon building production capacity than upon building airplanes—at least for the (*Continued on page* 56)

MAJOR AIRCRAFT FACTORIES ARE OVERTOOLING

Prime Manufacturers
Current plans call for widening U.S. production capacity even if it means building fewer aircraft.
★ Major airframe and parts plants in 1950 pre-mobilization operation.
● Major aircraft engine plants in operation and to be opened.
□ Airframe and parts plants to be re-opened, or sites of new plants.
○ Personal plane plants.

MILITARY NEWS

THE WAR IN KOREA

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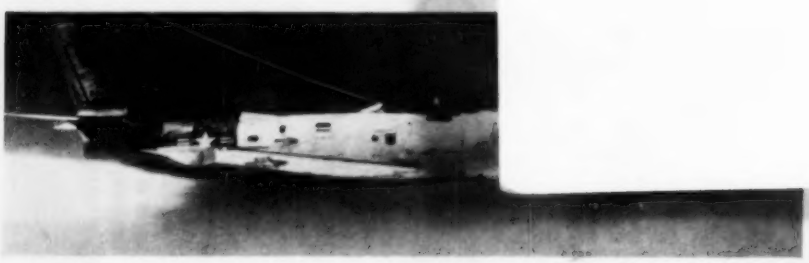
. . . **How many planes** in an Air Force group? The number varies according to the group's function, as follows: tactical fighter-bomber groups, 75; day interceptor groups, 75; all-weather interceptor groups, 36; tactical reconnaissance groups, 54; strategic reconnaissance groups, 30; troop carrier groups, 36 or 48; heavy bomber groups, 30; medium bomber groups 35 (also, in some cases, 20 tankers for flight refuelling); light bomber groups, 48.

. . . **Battle-tested** North American F-51 will be used in training by the Air Force. Texas Engineering and Manufacturing Company will build a two-seat version of the famous Mustang for service as a single-engined advanced trainer. Second cockpit will be fully-equipped. Plane's designation: TF-51.



New version of North American Sabre, the F-86D, powered by a GE J-47 turbojet with afterburner, recently completed rocket firing tests. The all-weather jet can carry 24 "Mighty Mouse" rockets which can be fired in various combinations, including salvo.

. . . **Consolidated Vultee** appears likely to be builder of the world's first atomic-powered aircraft.

. . . **Top civil defense** officials say that any possible Russian air attack would come over the Polar region, that 15 to 20 American cities might be hit with A-Bombs at once in any air assault.

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the locomotive and hit it with .50-cal. stuff to stop it while its pressure is still up. Make the first pass broadside, firing for the boiler before the engineer can open the valve that releases the steam. The boiler blows up when punctured with machine gun fire. Once the train is stopped, make other passes."

FLYING
VOLUME 49, NO. 1
JULY, 1951

Defense planners are gambling that war won't come for two years. If they are ... ts will be ready.

Risk'

AGES

SSING

derstand that you cannot turn
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the (*Continued on page* 56)

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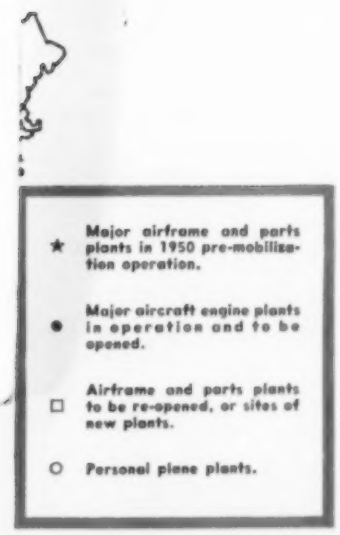
★ Major airframe and parts plants in 1950 pre-mobilization operation.
● Major aircraft engine plants in operation and to be opened.
□ Airframe and parts plants to be re-opened, or sites of new plants.
○ Personal plane plants.

Current plans call for widening U.S. production capacity even if it means building fewer aircraft.

REPORT FROM KOREA

The Indianhead

South of Wonju on Korea's central front, the Second Division's strip was a quagmire. But division pilots, used to much worse, called it a "top-notch" airport. The airfields in Korea are "unsatisfactory," the pilots wrote in a card to AOPA, "but there's lots of good hunting."

Artillery spotters gather in front of operations tent for briefing prior to starting missions over the division's front line positions.

Battered planes take rough treatment on Korean fields. Here, Capt. Thomas Ryan (rear) watches mechanics put new brake lining on L-5.

Pilots . . .

Rugged Aeronca L-16 was flying from a Second Division strip during heavy fighting in vicinity of Wonju, Korea.

'I don't know what the hell we'd do without them,' says American general in Korea.

By JOHN JEFFERSON

WITH THE 2ND DIVISION IN KOREA—This is one place where the hot fighter pilot doesn't sneer at the man who flies a light-plane. Many a fighter pilot flying in Korea has been directed to enemy targets by little brown-skinned Aeroncas. And no one knows better than the fighter pilots that it's a lot more comfortable to go into a target at 400 m.p.h. than at 110 m.p.h.—especially when enemy small arms and machine guns are spitting at you.

There was the time, back in early September, when UN forces were squeezed back into the tight perimeter behind the Naktong River. One day the Reds tried to push a tank column down the east coast toward Pohang. The column was spotted by Capt. Thomas Ryan of Portland, Ore., who was putting along at about 1,000 feet in an L-16. The enemy tanks began lobbing shells toward the little plane while Ryan orbited overhead, his observer calling for artillery fire. Within minutes, a Navy destroyer offshore was firing its five-inch batteries and some American tanks were crawling forward to get into the show. A road junction ahead of the enemy tanks was smothered with shellfire.

And then out of the south came two *Shooting Stars* and two *Mustangs*. Ryan wanted to get them on the target without delay, so he just nosed his Aeronca directly toward the tanks and with the plane shuddering dived almost directly into the mouths of the enemy guns. As he puts it: "I pulled up when I got close enough."

The tanks were knocked out.

Captain Ryan's incident—and that's exactly what it was, a routine incident—has been repeated hundreds of times in Korea.

The little planes direct artillery fire. They locate targets for fighter planes. They carry high brass on tours of the front. They drop C-rations to friendly patrols. Maj. Gen. Clark K. Ruffner, the division (*Continued on page 47*)

Checking Bell H-13C before hop, Sgt. Clarence Flowers inspects rotor. Capt. G. H. Laurence (right) is unit's engineering officer.

Landing at dusk, 'copter hovers above tents on muddy strip. Six of the Indianhead division's pilots now have helicopter ratings.

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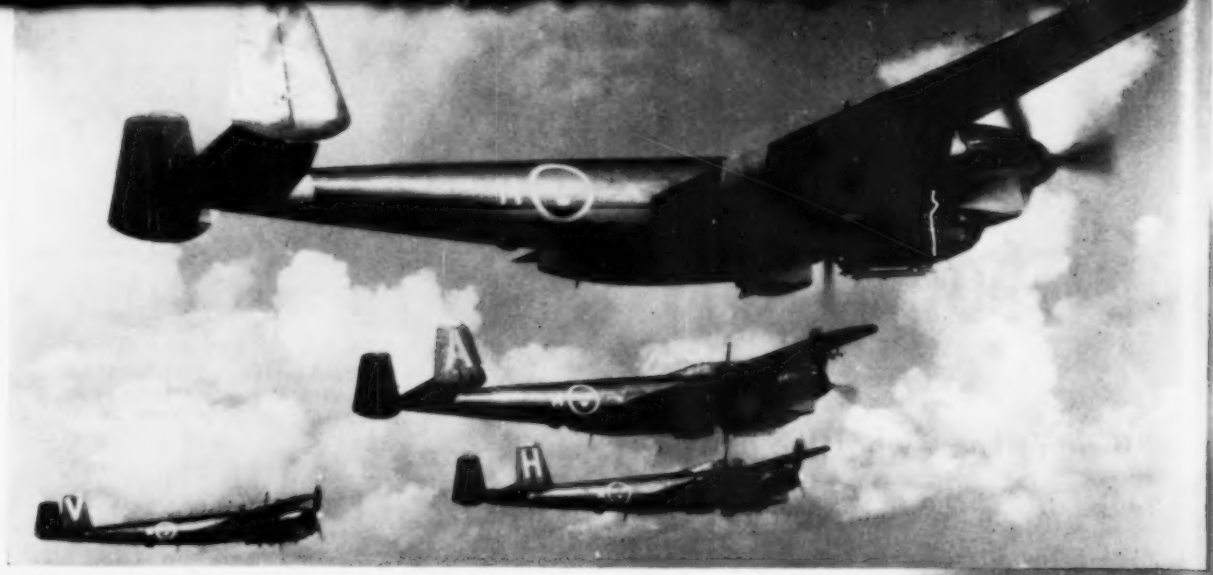

Attack bombers, Saab-18B twin-engined craft first flown in 1944, are still in use. Swedish-built Daimler-Benz DB-605 engines (1,875-h.p.) give the plane a 355-m.p.h. top speed. Over 1,500 later-type aircraft have been delivered to the Swedish Air Force since end of war.

Europe's

THIRD BEST AIR FORCE

Lars Brising, chief engineer of Saab, designed jet Saab-29.

PHOTOGRAPHS BY KARL GULLERS

IT WILL SURPRISE most Americans to know that the strongest air force standing guard immediately before the Iron Curtain belongs to Sweden. The air strength of this little country of 7,000,000 population is the third most powerful in Europe, falling behind only Soviet Russia and Great Britain.

If the power of the Soviet Union were turned upon the west, the Royal Swedish Air Force might receive the first blow. And it is for just such a blow that the Swedes are preparing. Radarscopes are manned and a chain of ground observers has been organized much in the same manner as in the United States.

In a country the size of Sweden, such a program can be developed only for defense. The Swedes have their own jets—fighters and fighter-bombers—and they are planes that could strike a strong blow in defending the country but could not possibly be considered a threat for offensive or strategic bombing.

The Swedish army and navy have traditions that go back hundreds of years. This summer the youngest of the services, the Royal Swedish Air Force, will celebrate its 25th birthday. It is an air force which has undergone a revolution since the end of World War II, when the Swedes, who have always gotten

Saab 21R was Sweden's first jet plane. A fighter powered by de Havilland Goblin engine of 3,000 lbs. thrust, it is modification of Saab 21A (see page 18).

Front view of Saab-29 emphasizes barrel-like fuselage. Gear retracts into belly.

Promising fighter is Saab-29 in big scale production. It is swept-wing jet in class of American F-86 Sabre.

Except for Great Britain, the Swedes have the best Air Force west of the Iron Curtain.

along with the Germans, suddenly awoke to the Russian threat.

Over 1,500 planes have been delivered to the Swedish Air Force since the end of the war, and of the more than one billion kroner spent for defense by the end of 1949, 450 million went to the Air Force. A long-range program is now underway to strengthen the Air Force in manpower, organization and aircraft. In 1948 the Swedish government charted out an expansion program for the Air Force with special attention to day-fighter units.

This program includes a 50 per cent increase in the number of aircraft per fighter wing—a Swedish fighter wing roughly comparing with a U.S. fighter group. Some wings have 36 operational aircraft and some have 54, reserves not included. There are about 16 operational wings, including 10 day-fighter wings, one night-fighter wing, four attack wings and one and one-half reconnaissance wings.

Pending the construction of her own Swedish-built jet fighters, the Air Force decided to buy jet fighters from Britain. As early as 1946 a number of British de Havilland *Vampires* had been delivered to Sweden, and these were soon supplemented by the Saab-21R—a Swedish plane powered by the same de Havilland *Goblin* jet engine as the *Vampire*, and

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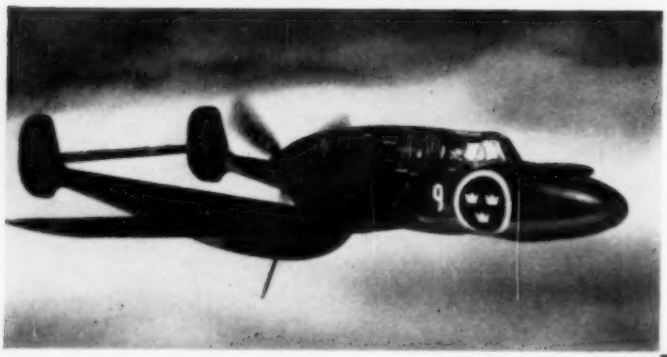


Saab 17A (top) is still in limited service as tow tug and seaplane. It was designed as a dive bomber, first flew in April, 1940, was Saab's first military model. Saab 21A (bottom), was announced in 1945, is unconventional pusher fighter powered by Swedish-built DB 605B liquid-cooled engine. The Saab-21A was basis for the first Swedish jet, the Saab 21R.

giving about the same performance. The engine is built under license by the Swedes. A series of 125 Saab-21R's were reportedly delivered, and *Vampire* orders are believed to have totalled 270. Other aircraft delivered to Sweden since the war are American F-51 *Mustang* fighters, British Supermarine *Spitfire* reconnaissance fighters and de Havilland *Mosquito 19* radar-equipped night fighters.

The pride of the Swedish Air Force, however, is the new Saab-29 sweptwing jet fighter which is certainly in the F-86—MIG-15 class. The Saab-29 (Swedish Air Force designation J-29) has an announced top speed of 650 m.p.h. and is powered by a de Havilland *Ghost* jet engine which is built in Sweden under license. The plane is nicknamed the "Flying Barrel" because of its bulky fuselage. At least 500 are reported to be on order and it is going into service this summer.

The peacetime Swedish Air Force has 33 fighter squadrons, 12 attack squadrons and five reconnaissance squadrons, according to Pelle Lofstrom, writing in the *American Swedish Monthly*. In addition there are training units, technical centers and a command organization.

Sweden has a number of advantages which more than offset the disadvantage of its modest financial resources. It has a strong reservoir of skilled technicians, engineers and metallurgists, years of experience in working with metals, and a strong supporting industry. It is only in recent years that countries like the United States and Britain, for example, have been able to approach the Swedes in producing such things as fine steels.

Most of the new Swedish aircraft are built by the Saab Aircraft Company *(Svenska Aeroplan Aktiebolaget)*, a privately-owned firm with large modern factories at Linkoping, Central Sweden, and at Trollhattan, north of Gothenburg. The main plant at Linkoping has a tremendous underground factory where all vital production is concentrated.

Saab started aircraft production under license from some U.S. and German manufacturers in 1937. First aircraft to be produced were Northrop 8A-1 single-engined dive bombers, North American NA-16-4 *Yale* advanced trainers, and Junkers Ju-86K twin-engined medium bombers.

Saab's first design made its first flight in the eventful month of April, 1940. This was the Saab-17, a single-engined dive bomber. It used at least three types of engines and was a two-seater, all-metal with a top speed of 270 m.p.h. The 17 came into service in 1941-42 and was "retired" in 1947-48, though a few are still being used as tow tugs for targets.

There followed the three-seat Saab 18, a twin-engined attack bomber and long-range reconnaissance fighter, which first flew in 1942. The B version was powered with two Swedish-built Mercedes-Benz DB 605D inline engines of 1,500 h.p. each, (*Continued on page* 41)

Sweden's latest planes are created in this design loft. The company's largest factory is located partially underground in a huge bomb-proof installation at Linkoping.

THE NEW PILOT RULES
Could Be Better

Says JOSEPH E. COULTER

Chairman, Department of Aviation, University of Oklahoma, the author is manager of Max Westheimer Airfield, Norman, Okla. He served as a consultant with the Examinations Section of CAA during June, 1950. An AAF flight instructor during World War II, Coulter has logged more than 3,400 flying hours.

The CAA is on the right track this time, even though the proposed regulations aren't the final answer, says author.

SOMETIME this summer, U.S. private pilots will face stiffer regulations when they attempt to secure their licenses. The proposed new rules are a commendable step in the right direction—but they aren't the final answer. They do represent the upward swing of a cycle which began in the 1930's.

Prior to 1940 the "Old Regime" of the CAA seemed to have as its primary purpose the perpetuation of the idea that pilots were supermen. To pass the private pilot written exam required knowledge of navigation and meteorology equal to the present commercial pilot examination. Following the war, when the aviation industry and the CAA predicted the great boom in private flying, pressure was exerted all along the line to reduce the requirements for the private pilot certificate. People were airplane happy but didn't want to go to the trouble of gaining the theoretical knowledge necessary either to pass the old written examination or *to insure their own safe flight*. An attempt was made to reduce the private pilot certificate almost to the level of the automobile drivers' license—and that is just what was done.

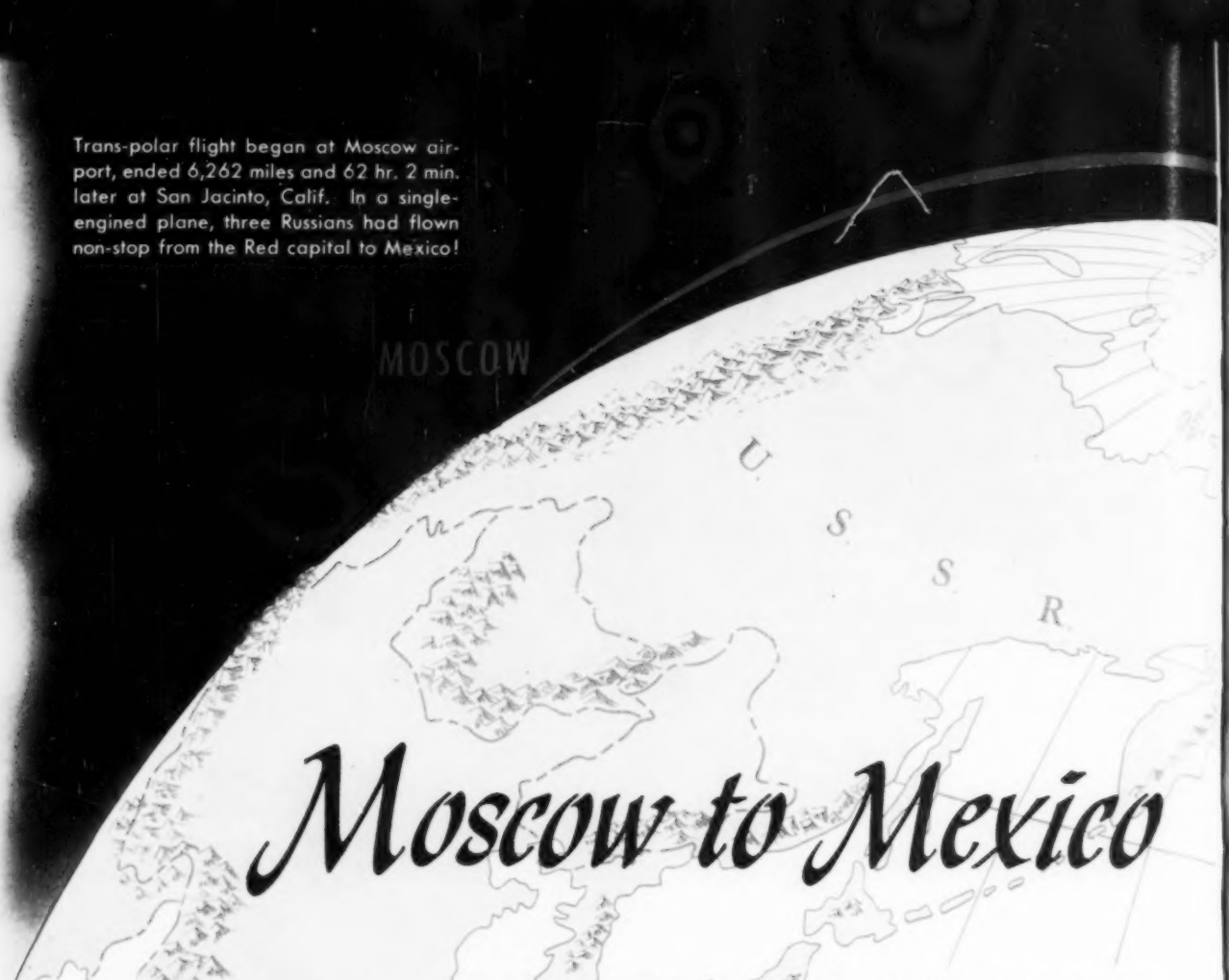
The simplified regulations made everyone happy. The public and the operators basked in the light of the reduced private pilot requirements. Businessmen could fly after work and on weekends, veterans could fly when they wanted to, and no one had to learn a thing except how to control the airplane. A little true-false test on Civil Air Regulations was "required" before solo if the instructor didn't forget to administer it.

It is frightening to realize that some private pilots certificated under these regulations do not even understand the airplane compass. They do not know the principle of magnetic variation. Some of them can not even use an aeronautical chart. The use of a protractor to measure a course is a complete mystery. Flying through rain at temperatures near freezing incites no fear in these ignorant souls. A little sunshine on the other side of a squall line is the guiding light to their doom. The average private pilot is not only ignorant of weather, he doesn't know where weather information is available, how to get it, or how to use it. The radio in the airplane, if touched at all, is reserved for communications with the control tower.

Yes, it's about time the pendulum swung the other way to bring the private pilot certificate up out of the student level.

The proposed amendment to Part 20.24 of the Civil Air Regulations reads as follows: "20.24 Aeronautical Experience. (a) Powered Aircraft. Applicant for powered aircraft rating shall have passed within the preceding 24 calendar months a written examination based on Parts 1, 43, 60 and 62 of this subchapter and on practical aspects of cross-country flight planning, weather recognition and forecasting, pilotage, dead (*Continued on page* 44)

Trans-polar flight began at Moscow airport, ended 6,262 miles and 62 hr. 2 min. later at San Jacinto, Calif. In a single-engined plane, three Russians had flown non-stop from the Red capital to Mexico!



Moscow to Mexico

Some think the Reds couldn't do it today—yet they did it in a clunker 14 years ago.

By SPENCER HELD

THE day was July 14, 1937. Russian-American relations were on a different basis than they are today. Everything ostensibly was sweetness and light. In the interests of "friendlier relations" the Soviets were even wooing the United States and one step in their campaign was to send a series of long-distance non-stop flights from Russia to America.

Over a period of several weeks three planes were to set forth for the United States over the North Pole. One of them was to be lost. The first landed June 20

Record-breaking plane, a big ANT-25-1, carried 12,000 pounds of gasoline, enough to give it an 8,000-mile range. The aircraft was powered by a 950-h.p. engine, had a 114-foot span. Three-man crew occupied a compartment four feet long—and less than one yard wide

Non-Stop...

at the Vancouver, Wash., airport after a non-stop flight of 5,288 miles.

And now the second plane was in the air. Radio contact had been established as it sought a landing somewhere along the West Coast. And then contact was lost. Was the plane lost, too?

At Moscow's Schelkovo Airport, the big single-engined ANT-25-1 had been fueled with 12,000 pounds of gasoline. If winds were favorable, that would be enough for 8,000 miles. Mikhail Gromov, pilot of the plane, was described as an "air racer" in Moscow press dispatches reporting his departure on July 12. The co-pilot was Andrei Yumoshev, a major in the Red Army, and the navigator was Sergei Danilin, a professor of air navigation and a writer of air navigation textbooks.

Just before take-off, Prof. Otto J. Schmidt, leader of a Soviet North Pole expedition; Moses L. Rukhimovitch, commissar of military defense, and Gen. J. I. Alksmis kissed the flyers on the lips as they boarded the plane.

"We plan," Gromov said, "to fly over the Pole and proceed toward the west coast of the United States, possibly with San Francisco as our destination." The engine roared; the big plane lumbered awkwardly down the runway, and slowly gained speed. It was almost out of sight in a thin fog before it finally got off the ground. Take-off distance was more than a mile.

Twenty-four hours later they reached the top of the world. Fighting snow and terrific winds, the plane crossed the North Pole at an altitude of 8,800 feet, flying about 100 m.p.h. (*Continued on page* 49)

Radar-packed Skyknight is in "over 600-m.p.h." class, has ceiling of "over 40,000 feet." Cockpit has side-by-side arrangement.

Night Prowler

With the most advanced radar ever carried by a production fighter, the Douglas F3D is able to find an enemy in the night.

THE CHINESE REDS move at night in Korea —and the Korean war has shown the need for night fighters to stop them. Today, Marine units in the U.S. are being equipped with the first Navy fighter designed specifically for night operation. The twin-jet Douglas F3D *Skyknight* carries the most advanced radar ever put in a production fighter.

More than 1,000 pounds of special Westinghouse radar gear is mounted within the normal contours of the F3D. Antennas are installed in nose, tail, vertical tail tip and dorsal fin. The new radar changes the concept of all-weather fighter operations completely. Hitherto, fighters had to be vectored in by ground radar stations to intercept "bogies" and they used their own weaker radar only for the final kill. The powerful radar installations in the *Skyknight*, however, permit direct interception of enemy attackers. In addition, side-by-side seating permits operation of plane or radarscope by either pilot or radar operator.

The *Skyknight* has tricycle gear, with the addition of an auxiliary tail wheel to prevent structural damage in landing. The cabin is pressurized and cooled. In emergencies, pilot and radar operator can escape by a tunnel leading through the bottom of the plane.

The *Skyknight* has about a 50-foot span. The two Westinghouse J-34 axial flow jet engines give 3,600 pounds of thrust each. Detailed performance is classified but Douglas Chief Engineer E. H. Heinemann says: "F3D tests indicate that it can successfully intercept any high altitude bomber that may attack this country during the F3D's normal life span." END

New night fighter went into service with first Navy squadron in early 1951. It will qualify aboard carriers in next few months.

DOUGLAS AIRCRAFT COMPANY, INC.

BEECH *C-35 Bonanza*

New shoulder harness permits free movement in cockpit, yet gives tremendous protection to occupants.

By ED HOADLEY

WE WERE sitting in the new Beech C35 *Bonanza* at 9,200 feet over the four-pointed star that is Wichita. I was on a combination flight with Claude Palmer, assistant chief test pilot—we were running a check ride and also flight-checking the plane before delivery.

We had climbed to 9,200 feet in only seven minutes. Claude had spotted our plane on one side of the half-moon at the south end of the runway, rammed the throttle, and since we were light and taking off into a 25-m.p.h. wind, we were airborne by the time we had crossed the runway—an even 150 feet.

Instead of levelling off a moment to pick up speed, the gear was lifted, flaps up, and we were on our way. The nose was angled about three inches above the horizon and we were indicating 1,100 feet per minute. All instruments were ticking it off with the tachometer at 2,100 r.p.m.,

All flight and engine instruments on plane the author flew were painted with chemicals which fluoresced from light beam located on ceiling.

Newest Bonanza has longer range, faster speed, increased horsepower. New leading edge wing fillet has greatly improved plane's stall characteristics. Noise level also has been reduced in improved design.

FLYING's CHECK PILOT

EDITOR'S NOTE

This series of articles is planned to help the pilot and prospective plane owner evaluate aircraft now on the market. Authors evaluate each aircraft through the eyes of the average private pilot who flies a plane for business or recreation.

26 inches of manifold pressure, and an even 100 m.p.h. indicated. There was a half-coverage of beautiful, heavy cumulus clouds blocking our path at 5,500 feet. Claude didn't fool around here, either. We were going up in a hurry, clouds or no clouds. At 7,000 we broke clear into the smooth quiet lake of the upper air.

Trimming the airplane was easy and in no time at all we had settled on 9,250 feet, 2,050 r.p.m., outside temperature 30°. Our indicated airspeed at this height was 154 m.p.h. which would true out at about 170.

A word about trimming the Beech for cruise. First, you trim with the electric switch which controls the propeller, i.e. "Hi r.p.m.—Low r.p.m." The throttle knob is left pretty well in. The large white cog wheel that controls trim is marked for "U" which means tail "up," and "D" for "down." In between the "U" and "D" are numbers, three, six, nine, etc. With take-off at zero, a good climb is obtained about "three, D."

With all the cruise characteristics checked we tried a few turns. There is a little yaw here and there in the turn, but not much. Beech has strung up the control system so that a gentle turn can be accomplished without rudder. Claude asked me to try it. Concentrating on the needle and ball, I worked a turn to the left. The ball stayed put and the needle nudged over to the left.

Then he asked me to whip it into a right turn, no rudder application. I did, and needle and ball did what they ought to. This is the first airplane I've flown that will do this.

Claude took it over and said he wanted to try a stall. Full power, gear and flaps up, 2,300 r.p.m., we pointed to the angels. Slowly our crimson job edged on up in a bird-dog point to the sky. As the airspeed passed through 60 m.p.h. there was loud horn in my ear. He eased it up a trifle more. My faithful seat-of-the-pants indicator indicated "it" was long past due. The climb indicator still pointed up, so we kept going up. The horn kept blowing. At 55 m.p.h. indicated, the tail (*Continued on page* 57)

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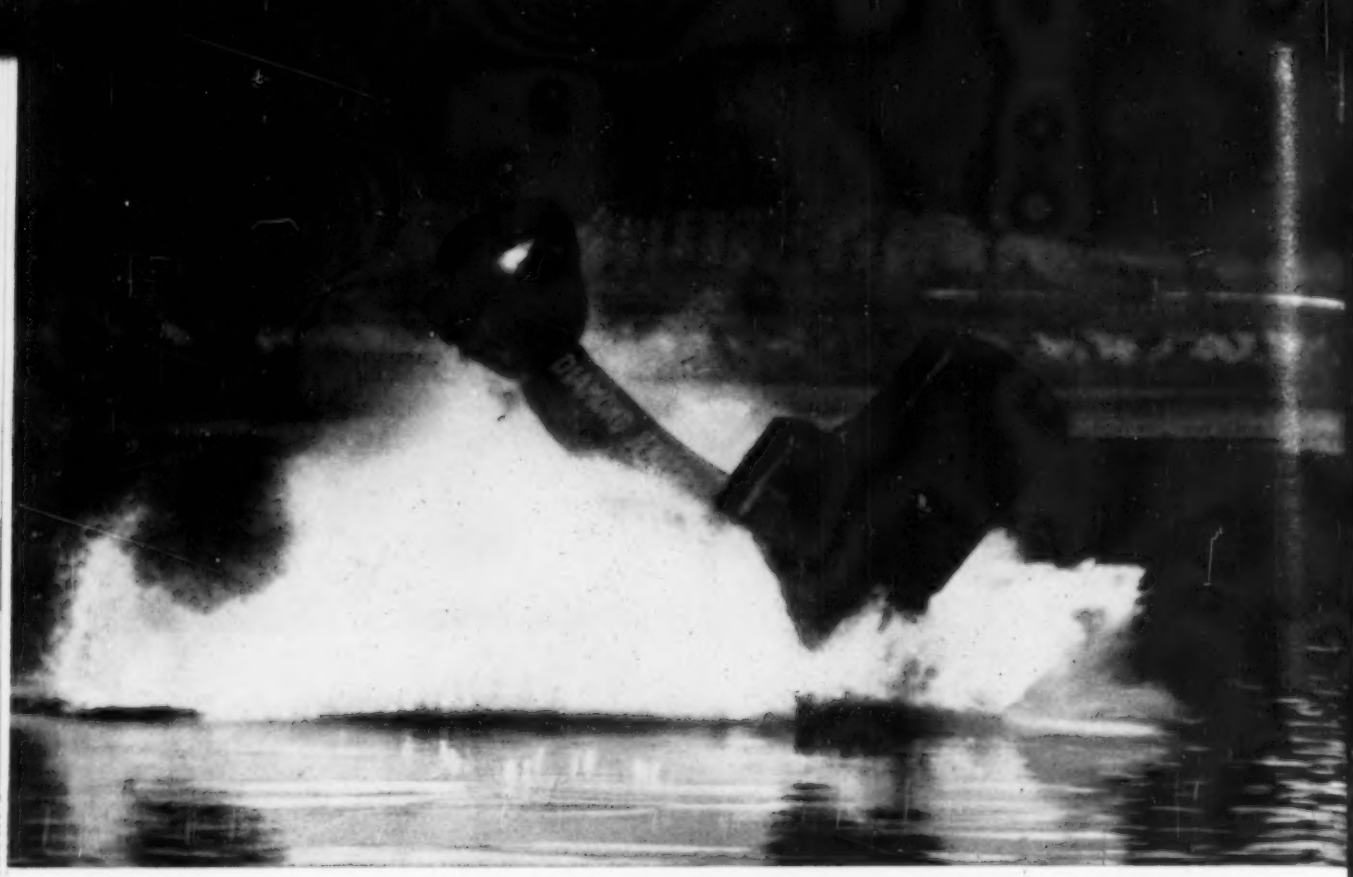


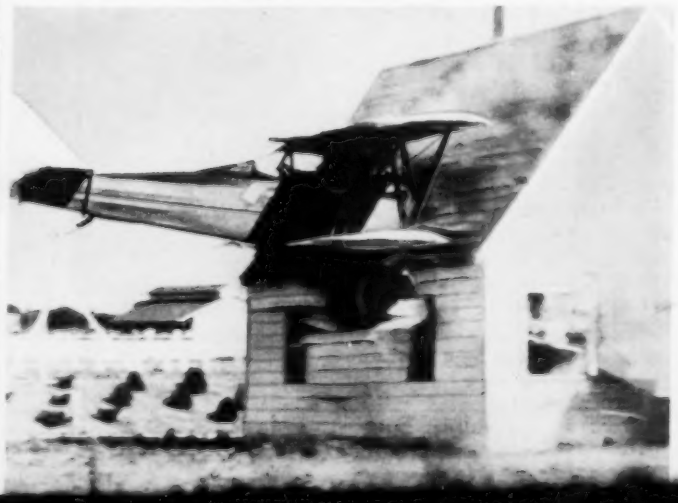
Water is hard—and dangerous. After this one trial at Lakewood Park, Atlanta, in 1935, "Bowser" Frakes gave up that kind of crash.

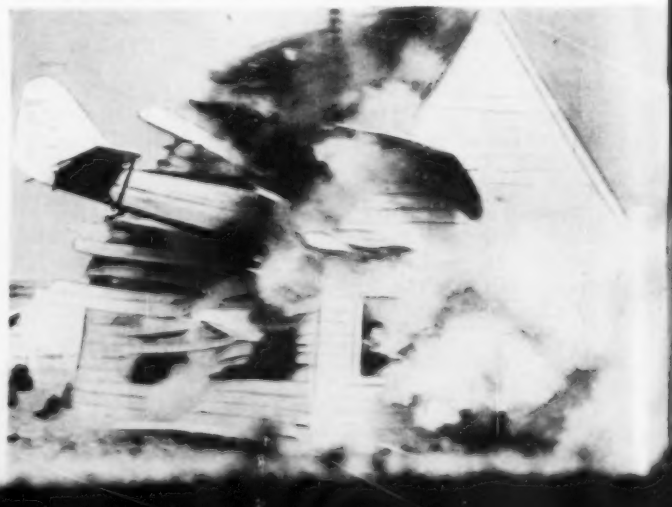
He Walked Away From 99 Crashes

By JACK DEALY

Captain Frakes, with short snorter and his prize elephant mascot.

Amazing photo sequence was taken at Sedalia, Mo., during St. Louis Post-Dispatch show. At left, Frakes' plane is just nosing into building. Right, plane is half-way through structure and dynamite charge has been set off. Plane and building were wrecked.





KNOW HOW to survive airplane crashes? It can be done repeatedly by a man who has the ability to relax when things look tough.

That's about all there is to it. Take it from F. F. "Bowser" Frakes, who has walked away from the wreckage of 99 planes!

Bowser Frakes' fabulous story began at McConnell Field in Nashville, Tenn., shortly after the stock market crash in 1929. Frakes and two other pilots, Frank Miller and R. A. Lindsey, pondered the depression's effect on stunt flyers.

"We need a new angle in this air circus business," said the tall, square-framed Frakes.

Lindsey and Miller nodded. "We need something," Miller said.

The three pilots looked about the airport. It was quiet, ghostlike. No longer were crowds swarming there to view simulated dogfights, low-level acrobatics, wing-swapping daredevils. Even passenger sight-seeing trips had dwindled to a halt.

"I've got it!" exclaimed Frakes. "We'll perform a real crackup."

Frakes' two partners stared at him in astonishment. "You must have already cracked up, Bowser," Lindsey drawled.

But Frakes was serious. He spilled a high-powered sales talk—and within a few minutes won their approval.

It's a dangerous way to make a living but 'Bowser' Frakes is still going strong after twenty years of smashing up airplanes to give the crowds a thrill.

"We'll draw straws to see who crashes the first plane," Frakes said.

The drawing of straws was brief and dramatic. Frakes won—or lost, depending on the way you look at it.

They found an abandoned airport near Mobile, Ala., for the site of the first fantastic stunt. A large crowd thronged over the field on January 26, 1931, as Frakes climbed into the cockpit of an old Stearman and waved nervously at the crowd. Shoving the throttle forward, he took off from the dusty terrain and purposely spanked the leaves of a tree near the field. Then he climbed to 2,000 feet, circled twice and kicked right rudder at stalling speed. The plane spun downward and he cut the throttle. After three turns, he pulled out into a slow spiral—and then, at about 500 feet, he eased back on the throttle and slipped toward the field. He straightened the plane, made a three-point landing—and kicked hard left rudder after rolling a few feet!

The plane veered to the left. The wing slapped the ground. An agonizing screech pierced the air as the wing scraped the earth.

When the dust cleared, Frakes was slumped in the cockpit and the plane's left wing was shredded, its prop splintered and the left landing gear buckled. A deathly silence hung over the crowd.

Then Frakes shook his head and climbed from the wreckage. The crowd roared approval—and Frakes was on his way to a world's record for walking away from crackups.

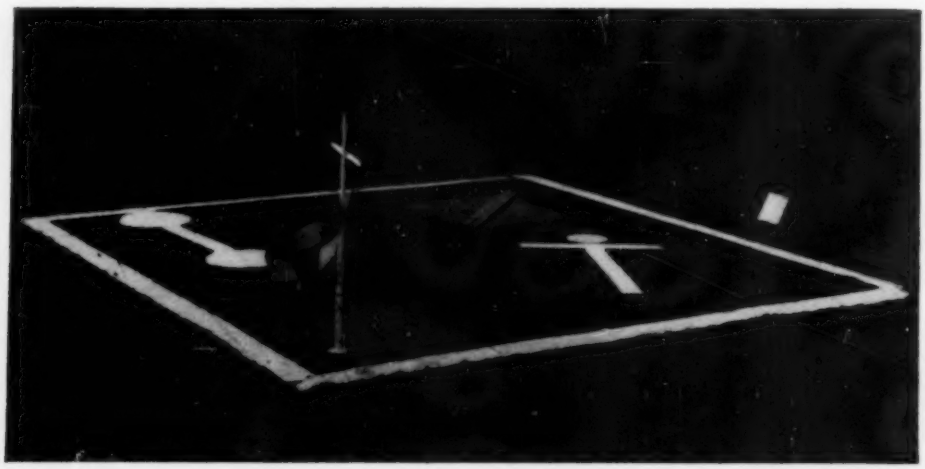
He gradually became a master in the art of crashing an airplane, varying the act by smashing planes into water, a mountainside, heavy board walls, frame buildings and finally flaming buildings with a simultaneous explosion of dynamite.

He carefully studied and planned each act. As a physical precaution, he used shoulder straps with pads beneath them. This was the only equipment used to escape injury, although on one performance he did wear a football helmet. While climbing for altitude to begin his act, Frakes would rehearse mentally the procedures he planned. At 2,000 feet he would snap the plane into a two or three turn spin, execute a falling leaf and go into the approach for the crash. About 30 feet from his target—usually a frame building—he would cut the switch. Then he would bend forward in the cockpit, pull his legs from the rudder—and relax.

Frakes tried crashing into an (*Continued on page 64*)

Fire was another hazard that Frakes constantly endured. There was always the danger that his crashed plane would catch fire and he would be pinned in its burning wreckage. Below, he is shown walking away from flaming debris in crash staged in Alabama.

DeHavilland Tiger Moth is old-time favorite with English flying clubs. The author noticed only one difference in flying British lightplanes. Props rotate counter to those on American planes and the resulting torque during take-off was puzzling at first.



The signals area at every airport is a big help to private pilots as most British lightplanes are not equipped with radio. Red-and-yellow checkered flag indicates the field is under Ministry control. Dumbbell sign means landings are to be made on the runways. Circle above the landing tee is a caution that landings not aligned with tee may be in progress. Yellow diagonal on red square indicates part of field is obstructed. Small triangular housing covers a pyrotechnical firing device for use in emergencies.

C. L. Holdup, secretary, beside
Argus, helped make U.S. pilot wel

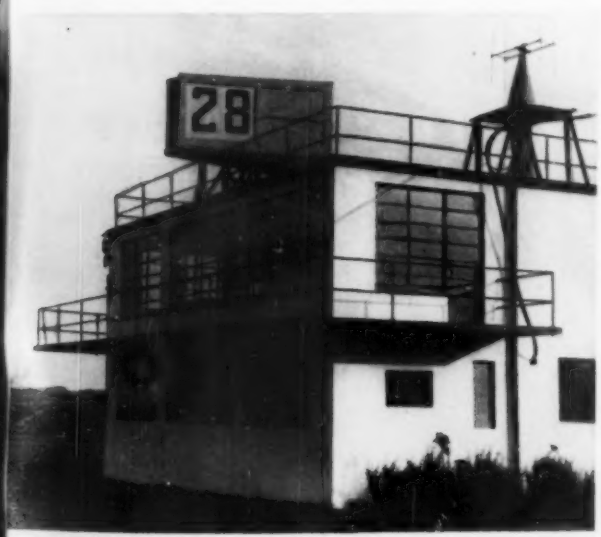
I Joined An English Flying Club...

by

BENNETT L. JACKSON

The author, an Army lieutenant colonel, is on duty in London as a staff officer with the Joint American Military Advisory Group.

Flying rules are simple but navigation is a headache to private pilots trained in U.S.



Unusual numbering system on top of Gatwick Airport control tower, near London, designates the runway in active use.

THERE was no familiar N number to identify the plane. Instead the letter G, followed by four more letters—AKIZ—appeared bold and large upon its sides. I was told that it was an Argus, though it looked like any other Fairchild F-24 to me.

C. L. Holdup, Secretary of the Surrey Flying Club, stood by and watched as I climbed in. I began a mental cockpit check; then I turned to Holdup and asked my first question. He laughed because he had been waiting for it. My question was, "Where is the radio?"

"That is the first question every American asks," he said. Then he went on to explain why few British private planes are equipped with radio. "It's a shame, really, for coverage of radio aids is excellent in this country. The difficulty is that the clubs simply cannot afford VHF equipment. The Ministry of Civil Aviation would like to make radio mandatory. I think the only reason they are holding off is that they know that every club kite in the country would be grounded by such a requirement."

My first flight as pilot of a British plane took place at Gatwick Airport, about 30 miles south of London. Only a few months before I had been flying my own *Swift* in the States. Upon being transferred to London, I had been afraid that I was through flying until I could return to America. I was wrong about that. While I haven't found anything to take the place of the *Swift*, at least I'm back in the air and a strange new countryside adds high interest. Exciting too is the fact that across a very narrow channel lies continental Europe, waiting to be explored from the air.

After hearing my automobile trunk called a boot and the hood a bonnet, I was prepared for even worse at Gatwick. It was a pleasant surprise, however, to find the flyers speaking my own language. True, they call every plane a kite, fill the tanks with petrol, and fly from aerodromes (only the big ones are called airports); otherwise, terms and procedures vary but little from ours.

My first step towards getting into the British air was, of course, to look after the license. The Ministry of Civil Aviation was willing to validate my American private license for a limited period and even indicated that renewals of the validation would be granted. As my stay is to be a protracted one, however, I elected to take a British license. All tests were waived except the one on aviation law. I found that (*Continued on page* 59)

UNIVERSITY OF MICHIGAN LIBRARIES

Eli Amanuel of Munk Aeronautical Laboratories installs Flex-O-Prop on Ercoupe while Bob Sanders of Sanders Aviation, Inc., Ercoupe distributors, looks on. Sanders helped author test Flex-O-Prop under rigid conditions described in the article.

A

New Twist in Props

Here's first check pilot report on an unorthodox wood propeller. It twists its blades in flight like an automatic prop.

By ED HOADLEY

FOR SOME TIME there have been rumors out of a little laboratory in Brentwood, Md., that an unorthodox new propeller for lightplanes was near completion. It was only wood, so the story went, but so engineered that it was actually an automatic propeller without a single moving part to actuate the twist of its blades.

About a year ago the first magazine article appeared on the Munk Flex-O-Prop, which was the name of this new propeller. Since that time the editors of FLYING have been trying to obtain permission to check fly it and see if it lives up to its reputation. The Flex-O-Prop was further perfected in the past year, and a couple of months ago Dr. Max M. Munk and Eli Amanuel invited me down to the Munk Aeronautical Laboratories in Brentwood to fly the Flex-O-Prop. I was the first magazine check pilot to fly this new propeller and this is the first report.

When one checks a propeller just what is the criterion? It cannot, without the most elaborate equipment, be judged alone. Its performance is a most intangible thing unless compared with another prop.

With this thought in mind we used a new, standard-make wood propeller for the first tests. A standard Flex-O-Prop was utilized for the second flights, and last a standard metal propeller was checked. We flew a standard Model "E" *Ercoupe*, 85 h.p. Continental, right off the flight line at Erco Airport, Riverdale, Md.

We had difficulty with the standard wood propeller in getting proper static r.p.m. Our first prop produced only 1,840 r.p.m. and certainly a test would be invalid at this speed. We then tied on another propeller of the same make from *Ercoupe's* stock. This prop revved only 1,825 r.p.m., even with urging. Finally the third, also new, wound up to 1,920 r.p.m. which was quite acceptable.

Standard Wood Prop Performance

Big Bob Sanders, partner in the Sanders Aviation Company, accompanied me in obtaining maximum performance from shiny, red-trimmed *Ercoupe* N94971. Down the line we wound up the engine and at 1,920 r.p.m. obtained static thrust of 315 pounds. All of us checked the scales on each reading. Then we taxied to the end of the runway and (*Continued on page* 51)

Author Hoadley, left, discusses Flex-O-Prop with Amanuel. Note blade of propeller (above) which has unusual scalloped insert. This has diagonal, instead of longitudinal fibres, giving blade a "hinge effect," its engineers say.

UNIVERSITY OF MICHIGAN LIBRARIES

The Best Way To

By V. A. FOSTER

THERE'S A NEW stall recovery technique out these days that is so far ahead of old-fashioned methods that, in the near future, the CAA inspector may not pass you unless you learn it. It's so good that safety men believe it won't be long before it has a definite effect on the 50 per cent of lightplane fatalities caused by stalls.

Dr. Dean Brimhall, research coordinator for CAA, recently disclosed a series of startling facts about stall recovery techniques which have many an old-time pilot reassessing his ability to fly.

The new method can reduce altitude losses by as much as two-thirds in some cases, Dr. Brimhall says, and that's altitude in the bank.

Builders and pilots long have tried to do something about the unhappy stalling characteristic of airplanes. Until about 1916 the only advice was to "stay out of 'em." In those early days a spin was as final as a tax statement is today.

As early as 1918 Maj. Al Williams had made test flights to try to discover better ways of recovering from and preventing stalls and spins. Basic theories tested by early pilots were recommended for almost 20 years with only slight variations.

Not long after its "birth" in 1938 CAA turned out a Flight Instructors Manual. There again the section on stalls showed little progress in stall recovery methods.

The Civilian Pilot Training program turned out thousands of young pilots with a good safety record. A rigid set of procedures on just how to enter and recover from each type of stall was taught.

Nevertheless, right up to 1950, flying out of a stall stayed just about as altitude-consuming as ever. But the CAA's research program has changed all that.

The program was undertaken by the educational Research Corporation under the auspices of the National Research Council Committee on Aviation Psychology, led by the brilliant young Dr. Phillip J. Rulon. Dr. Rulon sparked the project with admirable intelligence, practical methods and plenty of enthusiasm.

Results were astounding. After so many years of no advance in stall recovery techniques, at last something was learned and scientifically proven.

The following quotation from CAA Research Report 90 is well worth memorizing. The new technique is set down in restrained but clear language.

"With the exception of steep turns, if a stall occurs in a maneuver in which additional power is used or is available, and if it is necessary to recover with a minimum loss of altitude, the pilot should:

"Add full power . . . keep the nose of the plane on or close to the horizon, and

"Return, and/or keep, the plane level through use of

CAA tests with Cub disclose new technique for stopping stalls.

THE TEST PLANE

CAA Piper J-3 was put through thousands of stalls during investigation. Stalls from straight-ahead glide proved to consume most altitude and give least warning. Stalls were tested in 11 separate flight maneuvers, using 15 different recovery techniques for each. All tests were run with a Cub.

Stop That Stall!

rudder and elevator, going easy on the aileron control.

"The 'On Horizon' recovery will take longer than the more conventional procedure of 'dumping' the nose below the horizon—in some maneuvers it may take as long as 14 seconds. However, by sitting tight through the 'On Horizon' recovery, the pilot may effect recovery with marked savings in altitude loss . . . savings running up to, and exceeding, 100 feet. In certain maneuvers 'On Horizon' recoveries can frequently be made with loss of altitude not exceeding 50 feet.

"In steep turns it appears that the pilot should effect recovery through coordinated use of all controls without attempting to continue to turn.

"In stalls where additional power is not available (such as with engine failure) recovery can in general be made with least loss of altitude by letting the nose of the plane drop below the glide path and utilizing coordinated movements of all controls in effecting recovery."

There it is. A few paragraphs that may change every manual and flight test and save hundreds of lives in coming years. Two noticeable departures from traditional stall recovery will be found in the new method—the fact that for most stalls "dumping" the nose is not recommended, though "lowering the nose below path" and "below the horizon" in stalls resulting from power-off maneuvers and steep turns does (*Continued on page* 61)

YOU CAN TEST THE TECHNIQUE

If your plane is similar to the Piper J-3—

When power is available:

1. Add full power.
2. Keep nose on or near horizon.
3. Keep plane level with rudder and elevator.
4. Go easy on the ailerons (but use them).
5. Wait it out.

When no power is available:

1. Drop nose below glide path.
2. Use coordinated movement of all controls.

When stall occurs in steep turn:

1. Hold nose below horizon until speed builds up.
2. Coordinate all controls.

CAUTION: **Above recommendations are based on results with one plane only, flown by experienced test pilots. Practice these techniques in your own plane at a safe altitude.**

You can cut altitude loss as much as two thirds, pilots find.

LOW-ALTITUDE RECOVERY

Pilots like crop dusters, whose daily work involves low-altitude maneuvers, will benefit from new technique that enables stall recovery with a minimum altitude loss. Records of light-plane fatalities during recent years indicate that approximately 50 per cent were caused by accidental stalls.

Answers For Armchair Pilots

By

HARLAND WILSON

You can sell flying to your friends if you explain facts in easy-to-understand terms.

THERE ARE ONLY about a half million certificated pilots in the United States, which figures out to the surprisingly small proportion of one pilot for every 300 persons. A good many reasons have been advanced as to why there are not more, but one of the answers certainly is fear.

We don't mean fear of flying. We do mean the fear of armchair pilots to ask a few simple questions because they are afraid of showing their ignorance or of appearing inferior to men who already know how to fly.

Another reason why there are too many armchair pilots is because many pilots (a) don't want to dilute the legend of their intrepidity by encouraging any more pilots, or (b) they don't know how to explain about flying in simple language the layman can understand. They are used to using technical terms which again put into the minds of stay-at-homes the fear of appearing ignorant.

Accordingly I have designed a primer for would-be pilots which answers the unspoken questions that every non-flyer wants to know. It is intended not only for non-pilots, but for pilots who want to use it as a guide for selling aviation to men who never get closer to an airport than the pages of FLYING. Here are some of these questions and their answers:

Isn't flying dangerous?

Answer: Every time an airplane crashes it gets the headlines on the front pages of your home town newspapers. Yet for each airplane death there are nearly 100 automobile deaths which get a paragraph inside. This happens because airplane deaths are so relatively rare they get the news play while automobile deaths are so common the readers aren't interested—and the news gets buried inside. Because of this, the dangers of aviation are vastly overrated in the mind of the average man.

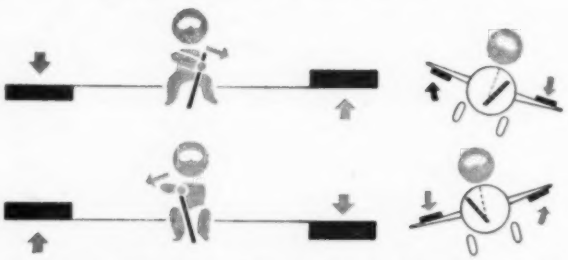
What is really important is who is doing the flying, under what conditions and under what supervision. Wings Incorporated, leading fixed base operator of Philadelphia, recently completed 20 years of operation involving nearly one million flying hours. During all those years not a pilot or passenger was even scratched. Across the country there are thousands of operators who have never had a crash injury among all the pilots flying with them.

In fact, statistics show that private flying is as safe today as horse-and-buggy travel was in 1909!

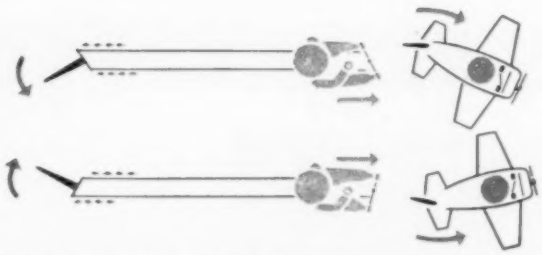
Still, people do have accidents. Why?

Answer: Nine out of every 10 serious accidents are caused by one of three reasons—buzzing, flying in bad weather, and stall-spin crashes. Not one of these will happen to a (*Continued on page* 54)

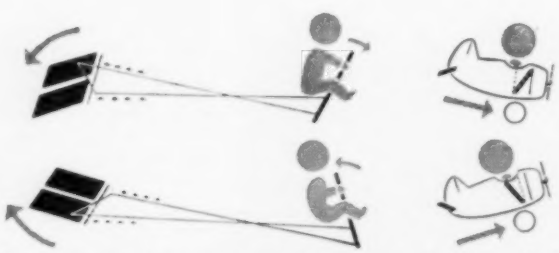
HOW DO YOU CONTROL A PLANE?



Ailerons control movement around plane's longitudinal axis. If you move stick to left, left wing is forced down, right wing up.



Rudder, operated by foot pedals, controls movement around vertical axis. If right rudder is pressed, plane's nose moves to right.

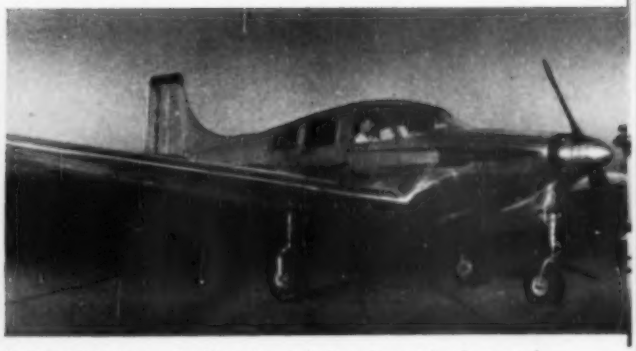


Elevators control movement around lateral axis. If stick is pushed forward, nose is depressed. Back pressure on stick raises nose.

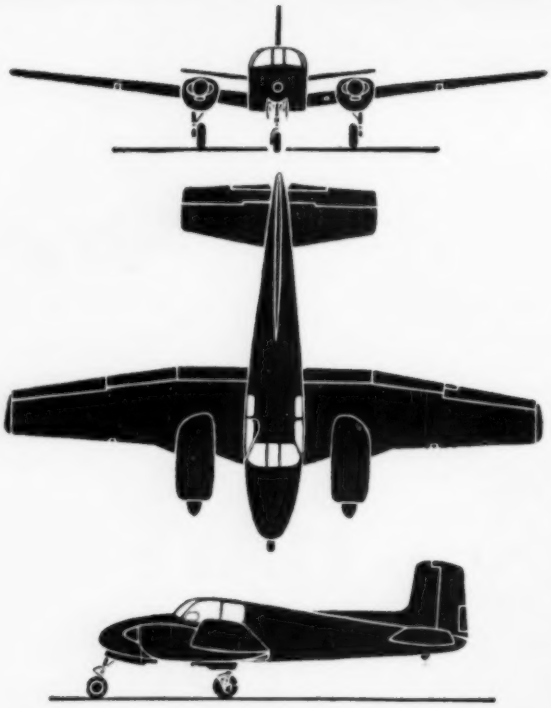
Modified Republic F-84F, sweptwing version of the Thunderjet, is powered by a 7,200-pound thrust Sapphire turbojet which will be built by Curtiss-Wright and General Motors. Note redesigned nose air intake, deeper fuselage to accommodate Sapphire.

HAVE YOU SEEN?

Sleek two-placer, the all-metal McKinnie-165, was built by Richard McKinnie in Fargo, N. Dak. Powered by a 165-h.p. Franklin engine, the plane has an estimated cruise of 180 m.p.h. at 7,000 feet. Wingspan is 26 feet, length is 18 feet.



Regent Rocket 260, R. S. Johnson's latest executive plane design, made first flight in April. The all-metal, five-place, tricycle-geared plane is powered by a 260-h.p. engine. Estimated cruise at 75 per cent normal rated power is 177 m.p.h. Span: 30.5 feet. Length: 26.25 feet.



New view of Beech Twin Bonanza (top) shows clean aerodynamic design, excellent visibility from cockpit. Plane is powered by two Lycoming G0435-C2 engines (developing 260-h.p. on take-off). Bottom: three-view silhouettes.

SOVIET RECORD-BREAKER

ONE of the most famous Russian lighter-than-air craft, spherical balloon SSSR-VR79 holds world records for duration and distance in its category (2,700 cubic meters) plus duration record for balloons of any size. Last October it flew 1,940 miles at an average height of 16,400 feet in 83 hrs. 29 min. In 1949, it reached an altitude of 39,400 feet with two-man crew.

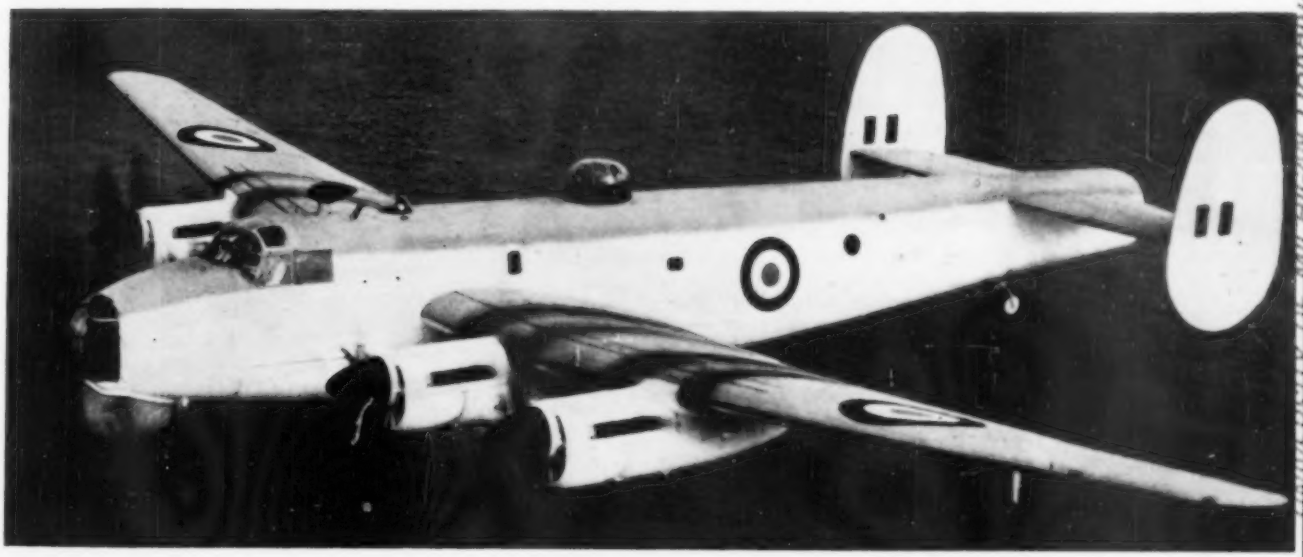
First copter powered by turbine coupled directly to a rotor shaft is French SO-1120. Engine: 220-h.p. Turbomeca Artouste.

Unusual version of Kaman K-225 was specially modified for Mississippi Geodetic Survey Commission. Note the copter's enclosed cockpit and twin tail.

Buck Private (XA-6) built by American Helicopter is one-place copter with pulse-jet at rotor tips.

TWO NEW SUB KILLERS

Newest version of U.S. Navy anti-submarine plane is the Lockheed P2V-5. Chief external differences are an added nose turret and larger wingtip tanks center-mounted at extreme end of wing (not shown in above photo). Plane carries more radar, electronics gear than its predecessors. Range, speed, other performance are substantially same. British Avro Shackleton (below) is radar-equipped anti-sub plane intended for long-range missions. It carries depth charges, bombs and mines, is equipped with six 20-mm. guns. It can also carry lifeboat for air-sea rescue.



British fighter-bomber. DeHavilland Venom (DH-112) has finned tip tanks plus jettisonable wing tanks. Note the boundary-layer "plates."

Chase XC-123A experimental jet transport (four GE J-47 jets) recently made first flight. Craft also has glider and piston-engined versions.

I Learned About Flying From That! NO. 139

By ALVIN F. HOLDERBECKER

Aerial hunters (author, center) display "just a few of the foxes and wolves" they once bagged in Montana. Holderbecker flew gliders during the European invasion; has over 3,000 hours logged "in everything from C-46's to Cubs."

Hy Sheridan's "A Lesson in Relativity" (March 1949 FLYING) caused a controversy that is still raging. If you were one of the many pilots who disagreed with Hy's theory, read this story of an old pilot who says he finally realized "just how wrong a man can be."

HUNTING WOLVES and coyotes from an airplane is a dangerous occupation, as CAB accident figures show, but it is lucrative and it has its special thrills. However, an accident I had while coyote hunting in January, 1946, is the kind of thing that could have happened to anyone. In fact, it is one of the few accidents I've ever heard of in private flying which I believe could not have been prevented. At least, I don't see how it could.

Before I go ahead, though, I'd like to point out that according to some of the readers of FLYING, this accident couldn't have happened at all. I hope my experience will do its bit to show them just how wrong a man can be.

It was in southeastern Montana on the morning of January 25, 1946. There had been a terrific windstorm during the night and early morning but the wind had gone down by daybreak. The barometer was high and it was cold—ideal for good engine performance. It seemed like a perfect day for flying.

Our strip lay north and south, 1,500 feet long. It was a little down hill for the run north. Wind was from the northwest 15 m.p.h. Perry Hendrickson and I had flown from the strip regularly and many times under unfavorable conditions.

We were loaded and ready to go. The engine of our civilian L-4 ran up perfectly. The wind continued the same and our skis would run perfectly over the hard-frozen snow. The only obstruction for miles was a low sheep fence off the end of the runway.

The L-4 acted like she meant business on take-off and we had 20 feet of altitude quickly, tapering off to a shallow climb. Airspeed was about 60 m.p.h. We were off for coyote country—or thought we were.

Then things began to happen.

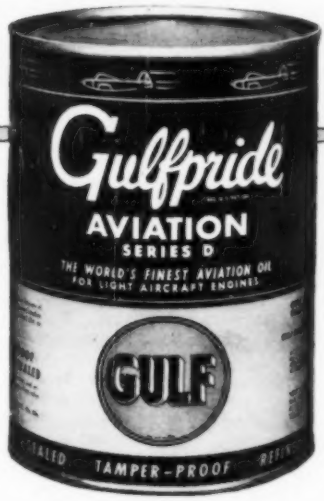
Our climb turned to a sink. The airspeed needle jumped back and forth. From there on I was so busy I didn't have time to look at it again.

Our engine was roaring sweetly. Ground speed was obviously picking up. Then why should we be sinking? There wasn't much time to think about that with the posts and wire coming up at us off the end of the strip.

I jammed in the throttle as far as it would go but we still were settling. The fence (*Continued on page* 63)

No matter what you fly... You fly better with GULF!

Yes, regardless of your plane's engine type, there's a great *Gulf* oil that will keep it running more smoothly—more efficiently—more economically! For example:



For horizontally opposed Aircraft Engines it's Gulfpride Aviation Oil-Series D!

Here is the world's finest detergent dispersant aviation oil, the only aviation oil put through Gulf's exclusive Alchlor process to remove extra carbon and sludge formers. Users have increased periods between overhauls up to 100%!

For radial Aircraft Engines, it's GULF Aircraft Engine Oil-Series R!

This is a fine quality, non-detergent, straight mineral lubricating oil! It's highly effective in retarding carbon and sludge formations and maintains body at high operating temperatures. Especially recommended for maximum operating periods between overhauls!

Don't settle for less! The correct Gulf aviation oil will solve all your lubrication problems. And, once you've tried it, you'll agree . . .

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AIRCRAFT OWNERS AND PILOTS ASSOCIATION

AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is: "To make flying more useful, less expensive, safer and more fun."

Headquarters are: 15th and New York Aves., Washington 5, D. C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.

AOPA PROTEST TO CAB

A recent decision by a hearing examiner of the Civil Aeronautics Board has caused AOPA to lodge a strong protest with that Government agency. The decision was issued in the case that evolved from the mid-air collision between a Pan American Airways *Constellation* and a private Cessna 140 over Long Island, New York, in January, 1949.

Following the accident, in which the two occupants of the Cessna were killed, the official accident report—also issued by CAB alleged negligence on the part of the airline pilot. The CAA then filed charges against the airline captain and his co-pilot. It is in the case filed against the captain that the CAB hearing examiner found him to be innocent of the charges.

AOPA has protested the decision, contending that the original accident report made it clear that negligence was involved and that in view of the fact that the two occupants of the Cessna were killed, the decision of the CAB examiner, in AOPA's opinion, is not justified.

In answering AOPA's letter of protest, CAB advises that the CAA also has protested formally, and has appealed the decision. That means the case now will be heard by the CAB members in Washington.

IT'S THE LITTLE THINGS . . .

What does AOPA actually do for its members?

We're asked that question every so often, usually by new members who haven't dealt with national headquarters, who haven't had an opportunity to read the various AOPA publications in detail, or who haven't had any trouble of their own. Unfortunately (for us) we can't always publish in detail every job we do for our many members who ask for help. However, here's a "routine" case that's typical of many hundreds we get:

A member in Connecticut who operates a seaplane base wrote us in May, 1950, saying he was having difficulty in clearing the title on a lightplane he'd just bought. In trying to solve the problem himself, he found it became so involved that he finally called on AOPA in desperation.

From that point on, AOPA handled nearly a quarter inch-thick file of correspondence in the member's behalf, involving a wide variety of persons and organizations concerned with the sale and title of that one small airplane. In addition, AOPA's Washington counsel had a personal conference with a CAA official on the matter.

When was that one small case finally settled? April, 1951—almost a year after we first went to work on it.

AOPA'S NEW HOME

AOPA's general offices have been moved to the new building shown in the accompanying photograph. The building is in Bethesda, Md., a suburb adjoining Washington, D. C., to the northwest. AOPA occupies the entire ground floor of the building; the top floor is not occupied by AOPA.

AOPA's official mail address is Box 5960, Washington 14, D. C. All mail should be addressed there. Our new phone number is Oliver 0500 (that's a Washington number).

Meanwhile, AOPA will continue to maintain a small conference office in downtown Washington. AOPA's old phone number—Sterling 6700—is retained there, but for that office only. Members should place long-distance calls to Oliver 0500; AOPA personnel are at that number nearly all the time.

Telegrams should be sent AOPA at our cable address: AOPA, Washington, D. C.

INSURANCE PLAN STARTS

AOPA's revolutionary new group life insurance plan for its members has officially gotten under way. The required minimum of 1,000 active AOPA members had signed up by the original May 1 deadline, automatically putting the program into effect.

The new insurance program is underwritten by the Minnesota Mutual Life Insurance Co., St. Paul, Minn., a 70-year-old company that currently has $700,000,000 worth of insurance in force.

The new program enables AOPA members to buy $5,000 worth of life insurance at standard group rates, with no specially-loaded premium charged because of each member's flying activities. The $5,000 policy costs $60 per year.

REVOLUTIONARY WATCH

AOPA has just completed arrangements with the Elgin National Watch Co., Elgin, Ill., to manufacture the first 24-hour wrist watch to be made available to pilots in the United States. The watch is to be resistant to shock and water, will have a black face with luminous numbers, and a sweep-second hand. It also will be equipped with Elgin's exclusive lifetime mainspring.

The special AOPA price of this unusual new watch will be comparable to that of a similar but conventional wrist watch. Full details in the current AOPA PILOT.

AOPA's new offices in Bethesda, Md., are located on the ground floor of this building.

Europe's Third Best

(*Continued from page* 18)

and had a top speed of over 350 m.p.h.—certainly one of the fastest twin-engined all-metal bombers of its time. Another version originally designed as a torpedo bomber has been refitted with a 57-mm. Bofors cannon firing 200 rounds per minute. Both of the B versions are still in service.

As soon as suitable jet engines were available from Britain, Saab began design work on a jet fighter. The Saab-21R made its first flight in March, 1947, only 12 months after work on it was started. The 21R was a development of the Saab-21A which was an unconventional fighter fitted with a pusher propeller and first flown in June, 1943. It had tricycle gear and top speed of over 400 m.p.h.

The jet-powered 21R, however, has a top speed of "well over" 500 m.p.h., though it is obviously an interim design and was never intended to be as important as the Saab-29.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

"The development of the airplane has been far faster than I ever dreamed. . . . In fact I fear that it is growing too fast for its own good . . . I fear it is growing faster than its public."—Orville Wright, Arkansas Gazette, April 30, 1926.

1950 Aircraft Year Book

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Engines for these jet planes are built by *Svenska Flygmotor* AB at Trollhattan, the sole Swedish manufacturer of aircraft engines.

Lieut. Gen. Bengt G. Nordenskiold, commander-in-chief, is credited with creating the modern Swedish Air Force. A jet pilot at 60, General Nordenskiold flies a de Havilland *Vampire*. Lofstrom writes:

"When the general took over as Commander-in-Chief of the Royal Swedish Air Force on July 1, 1942, he started at 7 o'clock in the morning in southern Sweden and when he put down his plane in a perfect landing at the Air Force base at Kallax in the very north of Sweden 14 hours later, he had paid a personal visit and made a speech at every Air Force station throughout Sweden."

Sweden has another advantage in the airpower race. It has a superior armaments industry. The famous Bofors factory produces first-class weapons for the Air Force, including the new automatic 57-mm. cannon which can fire 200 rounds a minute—better than three per second. Bofors also manufactures rockets.

Anyone evaluating Swedish air power gains an impression of modernity, alertness and great capabilities. The newest planes, particularly the Saab-29, are modern and fast. The supporting industry is ingenious, skilled, and capable of expansion. The Swedes would be strong and valiant allies, and any enemy who went to war with them would realize he had blundered into a hornet's nest. END

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THE MAIL BOX

"BEFORE I DIE"

I read with great interest Capt. Hy Sheridan's article, "Things I'd Like to See Before I Die," in April FLYING.

. . . I now know that at least one airline pilot has regard for the small-plane boys. I can honestly say that I've never held the "straight-in-approach-gentlemen" in esteem, due to many little personal incidents. You will find this feeling quite prevalent among private and commercial pilots of lightplanes . . .

It's unfortunate that Captain Sheridan can't get it across to some of his copilots that a lot of the small-plane pilots could buy the planes at one end of the runway and give them away at the other . . .

EDDIE LYONS

Springfield, Ore.

● *Says Hy Sheridan: "These airline pilots are not such a bad lot, really. If you don't believe that, ask some of them. The airliner is just not so handy as the lightplane. Did you ever steer a big, fat Texas girl around a crowded dance floor? You get all set and head for an opening and God help the lightweights who get in the way."*—ED.

A THOUSAND HOURS SINCE '28

We believe this old Ryan B-1, which belongs to Nelson Travis of Quincy, Mich., is one of the few left in operating condition today. It's in perfect condition and is flown almost every day. The plane [below] is still powered with the original

Wright J-5 engine and has only 1,000 hours total time since manufacture in October, 1928. If you know anyone else who has one of these old planes, we'd like to hear from him.

CHARLES E. YOST
Branch County Air Service
Coldwater, Mich.

FAIRGROUND AIRPORTS

I read in the March issue of FLYING a statement by Lloyd Graham of Kankakee, Ill., saying that they had the only airfield within a fairground boundaries. But at Duncan, Okla. (Stephens County), the airport and fairgrounds are on the same plot of ground . . . The airfield is 6,200 feet long with sod runways and is city owned.

I would like to see more of these fairground airports.

P. G. PIERCE

Duncan, Okla.

A LONG 20 MINUTES

I see in "Notes on Civil Flying" [April FLYING] that Caro Bayley recently set a new world altitude record by flying her Piper *Super Cub* "to 30,380 feet in a 20 minute flight." I admit that the *Super Cub* is a great plane—but 30,380 feet in 20 minutes!

LAWRENCE W. BERGNER

Chamberlain, S. D.

● *Miss Bayley's total flight time was 3 hr. 52 min. She spent 20 minutes at 30,380 before she decided she had reached the ceiling as well as her gas limit and started her 32-minute descent.*—ED.

AVID READER

I think my grandson, Michael Conway, is pretty alert for his age . . .

His father is a flight engineer and, to date, the baby has flown across the United States seven times . . .

MRS. DON GREGG

Long Beach, Calif.

HOW MANY BOMBS?

In "Twenty Years Ago" [March FLYING] you say "Italy's Caproni 90 P.B. was powered by six 1,000-h.p. engines and . . . could carry 17,600 pounds of bombs." If your information is correct, it carried more bombs than the B-36! Is that right?

WILLIAM HORNE

Burlington, Ia.

● FLYING's *right—but apparently your information is wrong. The Caproni 90 P.B. could carry 17,600 pounds of bombs; the Convair B-36 can carry a maximum bombload of 84,000 pounds. You're probably thinking of the B-36's design bombload for a 10,000 mile range, which is 10,000 pounds.*—ED.

A NAG OVER PANAMA

Looking through some past issues of FLYING, I ran across a small item that, for posterity's sake, ought to be corrected. The item said that "Gene Autry's famous stallion, Champion, was the first horse ever to be flown in a plane—in 1941."

In 1933, I was in the 25th Bombardment Squadron, France Field, Panama Canal Zone. During the latter part of that year three pilots took their wives to Rio Hato for a weekend. Each flew an old Keystone B-3A. During the somewhat hilarious weekend one of the wives bought a native horse. When they returned, the pilot flew back to Rio Hato with a crew, hogtied the horse and lifted him via the bomb hoist into the bomb bay. There, the horse was lashed securely and flown back to France Field, a distance of approximately 75 miles.

The plane used either was the one pictured here (of which a Staff Sergeant

Morris was crew chief) or its sister ship, Number 52, whose crew chief was a Staff Sergeant Rogozinsky. I was on the crew of the plane at the time this occurred. Incidentally, that's me creating induced drag in the rear cockpit.

Give the horse his due!

G. J. HAYES

Oakland, Calif.

JATO FOR LIGHTPLANES

I noted in December, 1950, FLYING an expression of interest in JATO for light aircraft by Mr. Al Curler of Torrance, Calif.

A rocket for small aircraft has been developed. This is the Aerojet model 12AS-250B which has been issued CAA engine type certificate number 250. The reason this rocket has never been offered for sale commercially is that it is classified for security reasons by the Navy. We do not anticipate immediate relaxation of this classification.

The requirement for some additional source of power for light aircraft appears to be well established and we are looking forward to the day when we can make such a device available to the operators of personal airplanes.

E. E. NELSON

Aerojet Engineering Corporation
Azusa, Calif.

ANOTHER AUTOGIRO

The February letters column says there are two Kellett G-1B autogiros still in flying condition. . . . There are three.

A modified G-1B [below], now known as the XR-3, is used by the General Elec-

tric Research Laboratory at Schenectady, N. Y., to test helicopter equipment and devices being developed for the Air Force.

This autogiro was one of the seven built for the USAAF in 1938, all of which suf-

(*Continued on page* 62)

"I can't afford not to belong to AOPA"

Says member-pilot

ROBERT CUMMINGS

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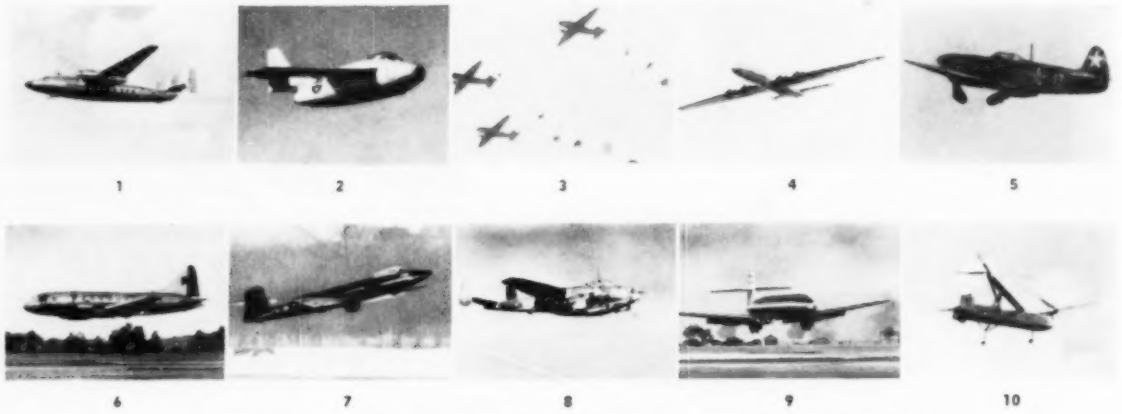

1 2 3 4 5

6 7 8 9 10

(1) Airspeed Ambassador 1 (Great Britain). (2) SAAB-29 (Sweden). (3) Douglas C-47 Skytrain (U.S.). (4) Bristol Brabazon 1 (Great Britain). (5) Yakovlev Yak-9 (USSR). (6) Ilyushin Il-12 (USSR). (7) Avro CF-100 (Canada). (8) SAAB-TIAB (Sweden). (9) Avro Jetliner (Canada). (10) Curtiss Air Horse XR-1 (Great Britain).

New Pilot Rules

(*Continued from page* 19)

reckoning, and general safety practices in the operation of aircraft."

The wording of this amendment adequately provides for the knowledge that has been found to be essential. It might be improved by eliminating the word "forecasting" and inserting the phrase "sources of weather information." A private pilot is certainly in no position to do even elementary forecasting. He shouldn't even attempt it. He should seek information from trained and qualified forecasters. The excellent services available through CAA Communications stations and the Weather Bureau should be made known to the student pilot. The students should be taught what to ask these people. The average private pilot should be as concerned with the velocity of surface wind at his destination as he is with the ceiling and visibility en route. He should learn to read or ask an interpretation of the winds aloft information; and what is more important, he should know the time of observation of this wind information since in many cases a winds aloft forecast will be more accurate.

Certainly some training in pilotage and dead reckoning procedures is necessary. The private pilot should not only understand the information on the chart but also how to use it. Some way must be devised to prevent the common error of incorrectly identifying check points. Inexperienced pilots often jump to conclusions that the check point on the ground is the one shown on the map when such is not the case. Perhaps it would be wise to use aerial photos in conjunction with the charts to check the accuracy of pilotage. Questions on dead reckoning must seek a middle ground. In actual practice, wind triangles are seldom plotted prior to take-off. Questions concerning wind correction and ground speed in flight are far more important.

The CAA has indicated that it plans to administer this new examination in the same manner as the present examinations. There is also some indication that the new exam will be of the true-false type instead of multiple choice. I sincerely hope this will not be the case. An objective type test is, of course, desirable if it must be machine graded. But this type of test has limitations which make it impractical. In each case the answer is given. It is up to the applicant only to determine the correct answer—or in the case of the true-false test, to decide if the answer given is true or not. This limitation makes it virtually impossible to ask certain questions that are important to the private pilot.

For this particular purpose a combination of multiple choice, true-false, fill-in-the-blank, and essay type of examination would be far better. These examinations could be administered through the Designated Pilot Examiners with grading done in the CAA District Office. With the present volume of student training it is doubtful that Airmen Agents are too busy to take on this additional duty. It would also bring the CAA agents in closer contact with student training. Through the use of Designated Examiners the CAA may be getting too far away from the "grass roots" of aviation. Under the present system there is no contact between the student or private pilot and the CAA. This contact should be re-established.

The weak spot in the whole idea is the lack of adequate study materials. The booklets Path of Flight, Realm of Flight and Facts of Flight are all good but should be combined into one publication. This publication also should include pertinent parts of the Civil Air Regulations and essential information on weather services, flight assistance, and use of radio aids which are found in the Flight Information Manual and which are important to the private pilot in cross-country flying.

Today, this information is now available only by ordering four or more separate publications from the Government Printing Office. Only bookstores or others who are willing to order in large numbers can now get a discount. When the individual flight school operator must pay full price for these publications he is not encouraged to handle them for the convenience of his customers. In most cases the price is printed in the book and he feels obligated to sell them at this price which actually results in a loss in handling them. Commercial publishers have not found it advisable to publish aviation study materials at a reasonable rate. The CAA is obligated to get back into the publishing business and make such publications available to the flying public if written examinations on the material are going to be required.

The CAA has announced that it will issue a list of study questions to prepare students for the new written examination. This is a deplorable situation. When study materials became available or inadequate, commercial publishers went into the study question business. For several years, we have had students studying *questions* instead of *subject matter*. There appears to be little interest in learning what is necessary for safe flight. The idea is just to study similar questions so that the test can be passed. Too many of our new commercial pilots know only what they learned by studying the right and wrong answers of sample CAA examinations. Now we have the CAA itself encouraging this practice. Have we all lost sight of what we are trying to do? Is the new private pilot going to have more aeronautical knowledge than before or is he going to learn to pass a test?

The changes in the requirements for aeronautical experience are primarily concerned with increasing the amount

of cross-country experience for the applicant. This is in line with the practice many flight schools have been encouraging for several years. Here at the University of Oklahoma we have had excellent results with a revised curriculum which increases the hours of cross-country flying from seven to approximately 13.

The new regulation will require a minimum of 10 hours solo cross-country experience. This is not too much. The regulation will also require at least five hours of dual instruction in cross-country flying after the applicant's first solo flight. In the light of our experience this is too much dual and at the wrong time. If short dual cross-country flights are made before solo, one additional dual flight of two hours over an area with few check points is sufficient. With short solo flights at first, the student will have no difficulty making longer flights without additional dual instruction. He will receive the greatest benefit from his solo cross-country experience, adding immeasurably to his confidence and to his realization that the airplane is a useful and pleasant means of transportation. If the five hours dual cross-country after solo is required it probably will result in waste of time on the part of the instructor and additional expense to the flight school. Such a regulation will surely be circumvented by the logging of solo flight time as dual instruction.

"And There I Was . . ."

A student and his instructor were on a training flight near Pensacola, Fla. They had neglected to switch the radio to intercom and their conversation was broadcast for everyone in the area to hear. It was decidedly one-sided as the instructor berated the student mercilessly. His sarcasm covered everything concerning the attitude, altitude and airspeed of the plane. He went on to make caustic comments about the student's low I.Q., general ineptitude, lack of coordination and family background.

After about five minutes of this, there was a short lull. Then over the radio came the voice of another student flying solo in the area: "What the hell d'ya expect for 115 bucks a month—Smilin' Jack?"

—James C. Miller

Under the new rules, student pilots would have to log at least 15 hours of dual instruction and 25 hours of solo time to get a license, regardless of whether the training plane is spinnable, non-spinnable, two-control or three-control. This recognizes the fact that recognition and recovery from a stall is far better than having to recover from a spin. It also indicates recognition of the fact that even our two-control airplanes can stall.

The flight test proposed under the new regulations is excellent in theory. It is designed to check maneuvers which the applicant will use as a private pilot—such as cross-wind take-offs and landings, short or soft-field take-offs, simulated emergency take-offs and landings. The greatest improvement appears to be the omission of the 180° power-off accuracy landings. Instead, the use of power, slips and flaps are all encouraged in order to land on the desired spot. This is certainly a wise decision.

One maneuver described in Part 4 of the proposed test is somewhat confusing. "4. Turns while maintaining a constant radius, or track, around a point, or area, including a 720° turn in each direction in a banked attitude of more than 45°." The first part of the sentence appears to describe a maneuver involving the same principle as the "around the pylon eights" now required. The remainder of the sentence sounds like the former 720° steep turns. It is impossible to determine from the wording whether this is two separate maneuvers or just one. It is also vague as to whether they will be performed at the low altitude of the former pylon eight or the higher altitude of the steep turns. The idea may be to incorporate a maneuver which may be useful to the pilot in circling a proposed landing area. In any event this wording is vague and a variety of interpretations may be made.

The main addition to the flight test is the cross-country flight to be planned and flown. Here is where the trouble will start. There is no doubt concerning the theoretical value of checking cross-country flying ability, but under the Designated Examiner set-up it is not likely to work well in actual practice. Of course the applicant will pick ideal conditions for taking the test that will eliminate any check on his judgment of weather. He will also be flying in an area with which he is thoroughly familiar. From the point of view of the Designated Examiner the flight test, if properly conducted, would take from three to four hours. It is too much to expect that such a flight test will be administered in the spirit in which it was written. Any regulation which by its inherent characteristics appears to be impractical is certain to be violated. This portion of the flight test will become a farce, leaving us with even less than we have now.

The solution seems to lie in stressing the aeronautical experience requirements and the knowledge requirements on the written examination, at the same time encouraging a stiff oral examination on cross-country flight techniques. These would supplement the flight test covering only the other proposed maneuvers.

Generally speaking the CAA should be commended for recommending these changes to the Civil Aeronautics Board. The CAA has given much time and thought to the new rules and has incorporated many suggestions made by flight school operators and other interested parties. The rules are sure to receive considerable criticism from many sources but it is high time the CAA quit yielding to pressure groups whose idea of advancement of aviation is a process of making things easier instead of making them better. Surely the CAA is on the right track this time even though it has not arrived at the right answer. END

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CIVIL AIR PATROL

WING TALK

CAP Program for Schools

A SPECIALIST in aviation education, Dr. Mervin K. Strickler, Jr., has joined the National Headquarters staff of CAP as Aviation Educationist in the Directorate of Training. According to a CAP announcement, Dr. Strickler will "develop and monitor the high school coordinated program of aviation education." He comes to CAP from Stanford University where he recently received a doctorate in Aviation Education.

Now a resident of Washington, D. C., Dr. Strickler served with the Army Air Forces during World War II. He set up an AAF College of Aeronautics under the Armed Forces Institute at Las Vegas in 1945, which processed 2,800 rated Air Force personnel for various types of certification under CAA regulations.

Dr. Strickler is now in San Juan, Puerto Rico, establishing an Aviation Education Workshop to provide instructor training for the CAP high school education program in Puerto Rico. Similar workshops, it is understood, are to be scheduled for all CAP wings.

At the same time, Civil Air Patrol leaders are taking advantage of the summer vacation season to enlist more sponsors for the rapidly expanding CAP High School aviation training program. This program to provide young men and women with an opportunity to study aviation in high school can be sponsored independently by a school or jointly with a Civil Air Patrol unit.

The study course offered by the Civil Air Patrol to interested schools is suitable for credit in the sophomore, junior, or preferably the senior year of high school. A one-period, five-day-a-week course, it has already been introduced and enthusiastically received in many high schools throughout the U.S.

Official textbook for the course is CAP's *Aviation Study Manual, Book II*, developed especially for this program by CAP's National Educational Advisory Committee, a group of nationally recognized aviation educators. This committee has also prepared a suggested daily teaching program which is outlined in another CAP volume, *Instructor's Manual, Book III*. When a school sponsors a study course in coordination with a CAP unit, these manuals may be supplied without charge by CAP. In other instances, the manuals can be purchased from the Government Printing Office.

Who can teach such a course? CAP recommends that the assignment be given to a regular instructor in the science, mathematics, social studies, or industrial art department. A technical aviation background is very helpful. Many colleges and universities are now sponsoring summer aviation workshops to qualify teachers to instruct courses in aviation.

In addition to classroom work, many outside activities can be scheduled. Among these are trips to airports, construction of air markers, and orientation and familiarization flights. These get-acquainted sorties will be made available without charge by CAP wherever possible. Flight instruction, however, is not part of the CAP program. It will also be possible for students, as CAP cadets, to participate in the annual two-week summer encampments held at Air Force bases throughout the country. Only cost is approximately $1.05 per day for meals.

Schools interested in sponsoring the CAP aviation study program will find local and state CAP commanders ready and willing to help get things started. Or information and assistance can be obtained by writing directly to Dr. Strickler at National Headquarters, CAP, Washington 25, D. C. Other organizations which may be of assistance are state departments of education or aviation, the U. S. Office of Education, and the CAA.

Although classes may be co-sponsored with a CAP unit, they are under the absolute control of the school principal.

USAF-CAP Liaison Officer

A PILOT veteran of two World Wars has again returned to active duty to become liaison officer between Headquarters, USAF, and CAP. He is Col. Robert H. Wheat, who replaces Lieut. Col. Kermit D. Messerschmitt as Executive for CAP Affairs on the staff of Maj. Gen. Earl S. Hoag, Special Assistant to the Chief of Staff for Reserve Forces.

A veteran of the World War I Jenny era—"when you flew the iron compass and hoped against an open switch in the tracks"—Colonel Wheat was recalled to active military service in May, 1941, as Chief of the Contract Division at Wright Field. He is now on extended leave of absence as Sales Manager of the Indiana Bond and Share Corporation.

Cadet Exchange

PLANS for 1951's big International Cadet Exchange have been completed, with all of the visitors from abroad scheduled to arrive at Washington, D. C., on July 30. American cadets will leave from Washington on July 27 and 28, returning two weeks later.

After a three-day visit in the nation's capitol, the foreign cadets will be flown to their host states, and will wind up their two-week visit to this country with a sightseeing trip to New York City.

During their stay in the United States, French cadets will be the guests of the University of Illinois, while the Dutch visit Michigan and the Swedes journey to South Dakota. Texas will have the carpet out for cadets from Canada and Switzerland. Taking over the New England states will be aviation-minded youths from England and Brazil. Florida will play host to young men from Portugal while groups from Denmark and Norway will sample California hospitality. Wyoming entertains the Spaniards and neighboring Utah will welcome a group from Luxembourg, while Idaho fetes the delegation from Mexico.

Latest Word

A LAST-MINUTE announcement from CAP National Headquarters advises that the National Drill Competition for the Colonel George Stone Memorial Trophy will be held July 20-23, at Washington, D. C.

ENCAMPMENT SCHEDULE

Here is the 1951 summer encampment schedule as released at press time:

LOCATION	DATES	WINGS	MAXIMUM ATTENDANCE
Maxwell AFB, Ala.	June 17-30 (tentative)	Alabama	50
Luke AFB, Ariz. (tentative)	Unknown	Arizona, Colorado	Unknown
Dover AFB, Del.			
Camp No. 1	July 1-15	Virginia, West Virginia	125
Camp No. 2	July 22-Aug. 5	Maryland, Delaware, National CAP	125
Robins AFB, Ga.			
Camp No. 1	June 17-30	Georgia	125
Camp No. 2	July 2-16	South Carolina, Florida, Tennessee	200
Atterbury AFB, Ind. (tentative)	Unknown	Indiana, Kentucky	Unknown
Otis AFB, Mass.			
Camp No. 1	July 1-15	Rhode Island, Connecticut, New Hampshire, Pennsylvania	350
Camp No. 2	July 22-Aug. 4	Massachusetts, Maine, Vermont	300
Selfridge AFB, Mich. (tentative)	Aug. 5-18	Michigan, Wisconsin	Unknown
Nellis AFB, Nev. (tentative)	Unknown	Nevada, Oregon	Unknown
Kirtland AFB, N. M.	Unknown	New Mexico, California, Utah.	160
Stewart AFB, N. Y.	June 24-July 7	Ohio, New Jersey, New York	200
Camp Grafton, N. D.	Starts last of July for 2 weeks.	North Dakota, Wyoming, Minnesota, South Dakota	300
Vance AFB, Okla.			
Camp No. 1	July 1-14	Iowa, Missouri, Illinois	100
Camp No. 2	Aug. 12-25	Oklahoma, Nebraska, Kansas.	100
Goodfellow AFB, Tex.			
Camp No. 1	June 25-July 8	Texas, Arkansas	125
Camp No. 2	Aug. 5-18	Mississippi, Louisiana	100
McChord AFB, Wash.	Unknown (Aug.)	Washington, Montana, Idaho.	Unknown
Elmendorf, Alaska (tentative)	Unknown (Aug.)	Alaska	Unknown
Hickam AFB, Oahu, Hawaii	Aug. 13-24	Hawaii	225
Ramey AFB, Puerto Rico	July 7-21	Puerto Rico	475

Indianhead Pilots

(Continued from page 15)

commander, told me: "I don't know what the hell we'd do without 'em." He meant it; and so do the doughboys of the Second Division, many of whom know the pilots by name even though they have never seen them personally!

During the bitter days at the Naktong, each Indianhead Division pilot averaged about 150 hours in less than a 30-day period. Three of the pilots and three mechanics got an Army commendation for dropping supplies to men caught behind enemy lines. And the oldest man in the outfit, Capt. Isidro Valdez, received the Silver Star. A rated helicopter pilot, Valdez has some 2,500 hours and has been flying liaison planes longer than any other man in his division.

He got the Silver Star for flying and directing artillery fire after weather had forced every other plane to the ground.

His L-16 is equally famous. You may remember the story from Fort Lewis, Wash., a couple of years ago about an L-16 that took off without the pilot. A passenger accidentally hit the throttle, then managed to get out with a few broken bones. But the plane took off, flew over the Cascade Mountains—and landed, intact, 110 miles away in a pasture! Valdez is flying that plane today in Korea. For the record, he wasn't the pilot who spun the prop while he let the passenger control the mags.

We were south of Wonju on the central front when I paid the Second Division a visit to see just how these liaison pilots operate. I had been with others—the First Cavalry boys in particular—but this was the first time I had the opportunity to go over the entire operation.

They were located on a dirt runway, bounded on two sides by snow-covered hills. Living quarters, chow hall, operations hut—all were tents, but comfortable. They didn't have what AOPA would call first-class facilities. The CAA would cast a dim eye on any lightplane pilot using such a mud-tracked one-way strip. But to these boys, it was a top-notch airport.

"We've flown off everything," said Capt. Troy Hammond, the operations officer. "Fields, roads, creek bottoms—even out of sand our planes couldn't taxi in." Their previous field at Chungju was the worst, so bad that a group of AOPA members sent in an airport rating card giving the strip an "unsatisfactory" report. But they pointed out that Korea had "lots of good hunting."

The pilots say that Korea is much worse than Europe during the past war. There's a lack of natural landing places. Usually the strips have to be built by division engineers, and that can often be frustrating. They had just built a strip at Kunuri when division headquarters was overrun and forced to withdraw six or seven miles. They had to build another strip—and even it wasn't safe.

Probably the most important job of the division pilots is artillery spotting. Observed fire is the most accurate, and each artillery battalion is ordinarily assigned two L-16's—which fly slower than the Stinson L-5's.

Capt. George H. Laurence, the engineering officer, tries to keep one of the L-16's for each battalion always in flying condition. His biggest problem is spare parts but he says that when the new Cessna L-19 replaces the Aeroncas and Stinsons the parts problem should be simplified.

Each Army division is assigned a certain number of planes but, as so often happens in war, the Second is a bit short at the moment. It has a Bell H-13C helicopter, three L-5's, two L-17's and 12 Aeronca L-16's. These are divided between headquarters and division artillery.

Strangely enough, only one headquarters pilot has had his plane hit so far—and he, three times. The first time was during the Naktong days. The pilot, Lieut. Wilford Baugh, was dropping supplies when he got a ground signal for a drop. He made a low pass when suddenly, above the growl of his engine, he heard the menacing bark of an enemy burp gun. The Communists had captured a U.S. soldier and were using him as a decoy. Baugh was shot down and managed to land behind UN lines in what he says was the "only dry spot in a fertilized Korean rice field." Neither he

DO YOU KNOW?

Are these men standing on a pier? A raised platform? A carrier deck?

(See page 60)

THE WEEMS LINE includes many navigation aids and instruments which are standard equipment with U. S. Air Forces, major air lines and foreign governments. Many are navigation "musts" for pilot and student alike, especially the Weems Mark II Aircraft Plotter, the Dalton E-6B, or Mark VII Computer. A few of them are described below. Many others are available.

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LOGGING TIME

WITH HY SHERIDAN

Captain, American Airlines

LEISURELY DAYS

I hear the Government has let a contract for the building of an experimental plane to fly 3,000 m.p.h. at 200,000 feet. There is grave doubt whether making progress so fast is progress at all. There is something about it that is frightening. Perhaps the solution of this mad addiction of wanting to be somewhere else is to like it here.

I for one regret the passing of the leisurely days when we would freshen our minds in that invigorating game called conversation, and we would discuss man and his works and his philosophies and art, and his attempt to explain them.

Now, airplanes are going faster and faster. Our lives are too. We no longer have time to read a novel or see a full-length play or hear a symphony through. We are going through life so fast that the scenery is a blur, and when the end comes, we will not know where we have been. Is this progress?

"You're headed for the grave, son," Will Rogers used to say, "what's your hurry?"

* * *

THOUGHT FOR TODAY

According to Senator Kefauver, more books are made than are read.

* * *

WHAT, ANOTHER THREAT?

Well, there's still a new threat to pilots. It seems like we get used to one and they give us another. Once it was riding boots—remember? And then it was stewardesses and now it is television towers. They are getting higher and they are growing in numbers, those spears.

One in Atlanta is 1,057 feet up, and there is one near Oklahoma City that is 968 feet high, and there are plans for several more poking up a thousand or fifteen hundred feet. The purpose of building them so high is to afford reception without ghosts, that is, reflections.

It is doubtful if they will achieve their purpose because if those towers seine me out of the sky and I become a ghost I am going to haunt the television people, and my favorite job will be to give goose flesh to the skin-bearing females you see on your screens.

And when you see a comedy hour that falls flat, or never did get up but just lies there, you will know who is at work: me, the ghost writer.

* * *

THAT'S THE SPIRIT

A little old lady came up to the ticket counter at the Chicago airport. "I want to go to New York," she said.

The reservations man asked, "When do you want to leave?"

"When the plane does."

DAFFYNITIONS

Supersonic plane. The only way that a man can avoid hearing that last word.

Three-point landing. The kind we make when nobody is looking.

Porpoise landing. The kind that is made when someone *is* looking; the kind that is not made on porpoise.

Hit the silk. A common but misleading term. Don't hit the silk. Pat it.

Radio. A device for combing static out of the air.

You are Number One to approach. The weather is now socked in.

Load. That which the plane can carry better than the pilot.

Where are you? A question the tower always asks you when you know darn well where you are, but what you wish the hell you knew is where he is.

* * *

HOW THEY WORK IT

Airliners are getting bigger and faster, so big and fast that one of the new planes can do the work of a couple of old planes. That makes it hard on the pilots—because the airlines don't need so many. A lot of pilots who have been captains for years are now flying as co-pilots again.

It is rumored that one of the senior captains, whose co-pilot was also a captain, made this in-flight announcement over the cabin loudspeaker: "Captain Flotsam is flying this leg of the trip. You know, some cheap airlines provide you with only one captain per airliner, but not this one. No sir, we furnish you with two. The two captains naturally divide up the work. One does the flying and the other sneers."

* * *

Many a girl invites a man to have a little nip because she is planning to put the bite on him.

* * *

We philosophers are disturbed not because we think that civilization is going to hell but because it now looks like such a short trip.

* * *

FAMOUS SAYINGS

Do you want to make something out of it?—Airways Traffic Control.

* * *

A psychiatrist, says Sadie the Stewardess, is a guy who frustrates your frustrations.

* * *

EPITAPH

How sad is the lot of him who forgets;
And short, how short seems the life as it goes;
How quiet he lies 'neath these violets.
No wind in his ears, no stars on his nose.

nor his observer were hurt and both were picked up by ground patrols.

Six of the division pilots have a helicopter rating, and as I am writing this story they are checking each other out on the new Bell.

Navigation and weather problems are simple. The pilots usually follow the MSR's (Main Supply Routes). To the uninitiated, even that's a problem. And weather? "Just take a look outside. If you think you can make it, you go. If you find you can't, you come back."

A radio truck is kept at the field, and is always in contact with each plane in the air. It knows at all times where the pilots are—or hopes it does—and maintains liaison with headquarters.

On a relatively quiet day, I copied the first 10 flights on the operations sheet:

1. 0730. Valdez. L-16. Check patrol at daylight. Check patrol in Wonju. Also check for enemy in hills to East.
2. 0730. L-16. Fly to Chungju for starter cable.
3. 0810. Black. Check on whereabouts of two patrols in your area. Artillery support for 23rd Regiment.
4. 0820. Hiller. L-16. Drop C-rations to patrol and register one battery.
5. 0830. L-17. Back to rear on administrative run.
6. 1000. Ryan. Take a major to Andong in L-5.
7. 1020. Valdez. L-16. Make patrol recon.
8. 1030. Hoffman. L-16. Fly Gen. Ruffner over 23rd positions.
9. 1100. Patrol recon and check Reds.
10. 1105. Check patrols.

Life has its frustrating moments for the pilots. Army intelligence officers wouldn't believe Captain Laurence when, on one of his early flights, he reported being fired on by enemy 122-mm. mortars. "We knew it wasn't ack-ack. But they just wouldn't believe anybody would use mortars for AA fire!"

Last September, Lieut. Mose Lewis was asked by artillery to reconnoiter to determine where the enemy was. He noticed a column of the 38th Infantry moving down a valley as a reinforcement when suddenly it stopped. "I flew down over the troops to see what was wrong. And I drew automatic weapons fire from the right flank. As I reached the head of our column, I drew fire that enabled me to see where the enemy strong point was located."

Lewis called in to division to report the enemy. He was asked to double check. He did. The Reds were deployed on the rear slope of a hill overlooking the MSR, and had one position only 900 yards from the division command post. Lewis called for artillery fire again. He was told he must be positive.

"I'm damn sure they're enemy," he said over the radio.

"Well, check again," division replied.

He flew back over the Reds, was fired at—and finally got an "affirmative" on his message back to the rear. "Continue on your reconnaissance mission," he was told. For his trouble, Lewis later discovered three bullet holes—all neatly puncturing the fuselage, about two inches above his head. END

Moscow to Mexico

(Continued from page 21)

They passed the Soviet polar base 13 minutes ahead of schedule.

News that the airmen had crossed the Pole came from Moscow. On the "down" side they picked up radio communication with Anchorage, Alaska, and other points. They crossed Great Bear Lake in northwest Canada. Radio stations in Alaska and Canada broadcast weather information to them as they flew over the Canadian Rockies.

Newspaper offices along the Pacific Coast were alerted Tuesday night, July 13, by a series of press association bulletins. The Russians inquired about weather conditions at Los Angeles and San Diego.

"Fog along the coast," was the radioed reply.

Mackay Radio picked up a message at 8 p.m. and relayed it to Army headquarters in San Francisco for translation. This indicated the aviators would pass Oakland and Los Angeles and, if possible, continue on to San Diego.

Bulletins:

ROSEBURG, Ore., 10:25 p.m.—Russian plane sighted overhead here.

OAKLAND, 11:17 p.m.—Soviet flyers report enough gas to reach San Diego.

SEATTLE, 1:28 a.m., Wednesday, July 14—U. S. Signal Corps reports that the Russians have passed over Oakland.

Along about that time their radio went silent and it was anybody's guess where they were. Soviet Consul General Grigori Gokhman of San Francisco chartered a plane for a search flight.

The wires hummed with rumors and conjectures. The *San Diego Union*, a morning paper, went to press with a story that ground crews were standing by at Lindbergh Field and the Naval Air Station on North Island. Navy men were ready to flash on powerful landing lights. The *Union's* "lobster shift" remained on duty. The *Evening Tribune's* aviation reporter, who ordinarily came to work at 7:30 a.m., checked in about 1:30.

Hours passed. Finally at 7 a.m. it was rumored that the plane was down in the Imperial Valley, on the eastern side of the Coast range. The *Tribune* hired a plane and sent a reporter and photographer aloft; they flew to Yuma, Ariz., and back, searching the desert and mountains without success.

In the meantime came a flash: The Russians had landed in a cow pasture at San Jacinto, 70 miles north of San Diego!

R. H. McCoy, an employee of a lumber company at nearby Hemet, had seen a big red-winged airplane circling over the rugged terrain. At 6:30 a.m. he watched it come down to a bumpy landing in the cow pasture; he hustled over and got the surprise of his life.

Three smiling men climbed out and spoke to him in Russian. Then they handed him three notes in English. The notes were one word each—"bath," "eat" and "sleep."

If the Russians could do it 14 years ago—in a beat-up single-engined airplane of only 950 h.p.—why couldn't they do it today? The answer is more than obvious.

It would even have been possible, had they wished, to carry a bomb on a one-way mission in that particular flight. For one thing, they had flown 6,262 miles in 62 hr. 2 minutes, setting a new world non-stop distance record. But they need not have started from Moscow and they need not have ended in San Jacinto. They could have flown 2,000 or more miles less and still have landed in the continental United States. The difference in gasoline consumption would have made a very sizeable bomb indeed. There was, furthermore, plenty of gasoline still in their tanks when they landed.

But 14 years ago, the enthusiastic Americans who received the flyers were not thinking about bombs—though what the Russians were thinking about can best be judged by the revelation that Pilot Gromov was not only a "racing pilot" but an Army colonel, holder of both the Order of the Red Banner and Order of Lenin.

Walter E. Harvey, a San Jacinto farmer, drove his car up to the plane as the trio climbed out. They bowed and smiled, shook hands heartily and handed him passports to show that they were officially entitled to land in the U. S.

Other cars began jolting over the pasture and soon there was quite a crowd. The Army's March Field, about 25 miles away, finally got the word and Maj.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

THE LIBRARY

JANE'S ALL THE WORLD'S AIRCRAFT, 1950-51, published in the United States by the McGraw-Hill Book Company. About 461 pages plus advertising supplement. Price $20.

This standard compendium of aircraft and engine information of the countries of the world maintains the high standards of past issues. There are 405 new illustrations in the airplane and engine section alone, including 63 new aircraft which made their maiden flights during the year ended May 31, 1950, of which 33 were jets. FLYING's European Correspondent, Charles W. Cain, was a consultant in compiling the Soviet Union section. After an absence of 10 years, an airship section has been reintroduced. This is an invaluable reference work for the serious student of aircraft and aircraft engines.—C. F.

THE AIRCRAFT YEAR BOOK FOR 1950, official publication of the Aircraft Industries Association of America, Inc. Edited and published by the Lincoln Press, Washington, D. C. 477 pages. Price $6.

Editor Fred Hamlin and his staff have continued the good work of the 1949 Year Book.

Here are a few of the subjects covered in this comprehensive work: "Engineering," "The Government and Aviation," "The Airlines," "Lightplanes," "Planes in Production," "Engines in Production," "New Things in the Air." Included also is a day-by-day chronology of aviation and a listing of aviation books published in the U. S. in 1950.

Anyone who wants to keep up with pertinent aviation developments and data should have this volume.—L. H. B.

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Check one ☐ Veteran ☐ Non Veteran F-7

Victor H. Strahm flew to the scene in a single-seat fighter. A half-dozen Army men followed in an auto.

Major Strahm extended greetings, inspected the aircraft, posted a guard, and drove the flyers to March Field.

Bath, eat and sleep—that's what they wanted. They got the bath first, in the Officers' Club, after telephoning the Soviet Embassy in Washington. While they were enjoying a hot shower Consul General Gokhman showed up. He dashed into the shower room and immediately torrents of Russian almost drowned out the splashing water.

The airmen refused Scotch-and-sodas for breakfast. They had milk, ham and eggs, buttered toast and coffee.

When they lined up to be photographed and questioned they were smiling and in good spirits but obviously dead-tired. Each wore gray trousers, neatly pressed. Pilot Gromov wore a blue shirt and necktie, Yumoshev and Danilin white shirts, open at the neck.

Gromov looked older than the others. Tall, taciturn, he had an air of quiet efficiency about him. Yumoshev was the glamor boy of the outfit. He too was tall, with wide shoulders and wavy brown hair. Danilin, somewhat shorter, resembled a benevolent Humphrey Bogart.

Consul Gokhman buzzed around busily. He acted as the "middle-man" and some of the press representatives soon developed a dislike for his officiousness. But he was voluble and valuable as an interpreter.

Pointing to San Diego on the map, the pilot moved his finger in circles around the city. "We circled 2½ hours in that vicinity," he said, "going as far as the Mexican border, but we couldn't find a hole in the fog."

Gromov and his companions said they had retraced their course northward, vainly seeking March Field. Their maps didn't show the Army airport. Then one of the gasoline tanks sprang a leak. They were over mountains at the time and things didn't look too good; but suddenly they spotted a flat area—the cow pasture, three miles west of San Jacinto—and brought the plane down safely. The gas tank was leaking a stream.

"The hardest part of the flight was the take-off," said Gromov. "Then, when we were between Rudolf Island and the North Pole, the wings began icing. But we had a de-icer and got through all right. The weather was most difficult at the roof [the Pole]. There were cyclones and anti-cyclones. The highest we flew was 18,000 feet over the Rocky Mountains. We used some oxygen there. We had enough for 24 hours and didn't use it all."

Gromov revealed they heard the Russian radio stations clearly until they crossed the Pole; after that the reception faded out.

He was asked why they did not give their position while over Southern California.

"It was of no interest to us to tell where we were," he replied. "We knew where we were going. And after turning back from San Diego we had some gas left. I think all long-distance flights should be made with single-engined planes—they are more economical."

Meanwhile, T. Claude Ryan of San Diego, builder of Lindbergh's *Spirit of St. Louis*, checked the Soviet aircraft's instruments as a National Aeronautic Association timer. "The gas tanks extended almost to the wingtips," he reported, "and there was plenty of gas left in the tanks."

Ryan said the plane had a 113-foot wing span and the landing wheels were 24 feet apart. There were no brakes—it rolled a long way after landing, he added.

The crew's compartment was only four feet long and less than a yard wide—smaller than the area of an office desk. Even the provisions were stored in the wings, according to Ryan.

Maj. Edison Mouton of the National Aeronautic Association described the primary construction as excellent. "We were astounded," he said, "on opening the engine cowl, to see not one drop of oil. The engine was as clean as if it just had been wiped. However, the secondary construction, including the fabric, was poor."

President Franklin D. Roosevelt wired, "Your achievement has aroused great admiration."

By this time the Russians were blinking and yawning in the bright sunlight at March Field, so their hosts led them to sleeping quarters. Consul Gokhman, who had been up all night, also went to bed.

They awakened late in the day. San Diego had invited them to a civic welcome; they traveled to that city by auto and registered at a downtown hotel. After breakfast Thursday morning they went shopping.

At a swanky luncheon that noon the program was broadcast over a 72-station national hookup. The men from Moscow, wearing new suits, were greeted by Mayor P. J. Benbough and felicitated, also, by Vice Adm. F. J. Horne and Rear Adm. Sinclair Gannon.

Maj. R. H. Fleet, president of Consolidated Aircraft Corp. (now Consolidated-Vultee), congratulated them for accomplishing "one of the finest flights I ever heard of in the history of aviation."

In a talk which Gokhman interpreted, Gromov expressed appreciation for the cooperation of the U. S. Army and Navy and other agencies and said he hoped the flight would strengthen ties of friendship between the United States and Russia. The Soviet government prepared for it for 18 months, he said.

The next day in Los Angeles the flyers rode in a nine-car parade through cheering crowds to City Hall, where Mayor Frank Shaw gave them an enthusiastic reception. Red roses and confetti were showered upon the visitors. Many women wore red dresses; many children carried red balloons. Communists hawked copies of the People's World and other leftist literature. Scores of dignitaries attended a civic dinner for the Russians.

It was quite a flight, and you didn't have to be a Communist to appreciate it.

END

15 YEARS AGO

FROM the July, 1936, issue of this magazine:

Howard Hughes' racer—"one of the fastest things on the face of the earth"—broke the International Landplane

Speed Record with a top speed of 352.46 m.p.h.

The Avro Anson, a new reconnaissance plane, was the first RAF aircraft to be equipped with retractable landing gear. Powered by two 310-h.p. engines,

the Anson's top speed was 188 m.p.h., cruising speed 158 m.p.h., and service ceiling 19,500 feet. It carried two 100-pound and eight 20-pound bombs.

"The latest air weapon—a parachute bomb to be used by the new speedy attack planes—was recently demon-

strated at Fort Benning, Ga." (Above photo shows a B-25 unloading parachute bombs on a Jap airstrip during World War II.)

A three-place sportplane, the Waco F-6, was described as "an absolutely new

plane of radically different design and new engineering features."

"The Russians have authorized construction of a rocket projectile designed to rise 34 miles at a speed of 2,200 feet per second."

TWENTY YEARS AGO

The States Super Monoplane, a two-placer powered by a five-cylinder 100-h.p. Kinner radial aircooled engine, was priced at $3,645, FAF.

New Twist in Props

(Continued from page 31)

waited for the mechanics to get their measuring apparatus organized. Throughout the tests we used bases of five m.p.h. cross-wind, temperature 32°, pressure 30.20, murky overcast and occasional flakes of wet snow.

Using a chain measure two mechanics checked our three take-offs and averaged the distance at 596 feet. Then we broke ground for the air work. From standing start to 60 seconds later we found that the *Ercoupe* had reached the 500 foot mark on the sensitive altimeter. Leaving traffic to the right we climbed out over heavily wooded country to 1,000 feet. From this altitude we climbed maximum performance for another 60 seconds. Results were 700 feet per minute at 2,075 r.p.m.

Dropping back to 1,000 feet we levelled her out over a course. Bob trimmed and re-trimmed to obtain best results at different r.p.m. settings. Our first run was at 2,100 r.p.m. Airspeed slowly settled on an indicated 92 m.p.h. With throttle eased upward to 2,200 r.p.m. we cruised 94 m.p.h.; 2,300 gave us 98 m.p.h.; 2,400 r.p.m. indicated 105 m.p.h., and finally at a wide-open, full up throttle of 2,550, level flight, we indicated 117.

From cruising speed (carburetor heat "on"), the throttle was pulled off. In many cases vibration is an abstract, immeasurable quantity. A jittery student will complain of vibration in a new sewing machine. We wanted to record impressions, if any, of comparative amounts of "floor-board quiver." In this case there was no particular vibration one way or the other. Checking further, the wheel was yanked back and the airplane headed for the overcast. We were searching for so-called "dead spots." Some pilots claim a momentary lag in a propeller before settling into a climb. Sanders and I agreed that there was no lag in this propeller.

Performance of Flex-O-Prop

Back at the airport we drank a Coke while waiting for the mechanic to stick the Flex-O-Prop on. Description of this glamorous hunk of wood is difficult. Amanuel calls it a "pitch-changing one-piece propeller." Frankly, it was the spitting image of a "garden-variety" prop. It was identical in planform and thickness ratio to most standard makes. It had the usual birch and the usual laminations running lengthwise. If the wood were painted, an experienced mechanic could not tell one from the other.

There was just one essential difference. From the hub to the tip on both sides of the blades Amanuel had scooped out part of the laminations and had inserted diagonal laminations. In planform they appeared like long slender meat platters. Amanuel indicated that he had had to invent and construct a special machine to do this type of work.

The clouds had raised a little as we taxied out but they were still grayish, heavy, and threatening. Once again after a pre-take-off check of 2,060 r.p.m., we made three take-offs. After careful measurement we found the *Ercoupe* had taken a 503 foot average to become airborne.

The whir of the wide-open 85 Continental told me that the prop was winding. The *Ercoupe* swung into a medium climbing turn to the right. At 60 seconds from start of take-off I checked with Bob on altitude. It was 520 feet—a gain of 20 feet from the standard wood prop.

At 1,000 we clicked the clock and climbed. Sixty seconds elapsed—we were 790 feet higher—a gain of 90 feet over the standard prop.

Descending to 1,000 feet to obtain a consistent altitude for scoring, we trimmed the *Ercoupe* to 2,100 r.p.m. and read 92 m.p.h. Ascending the tachometer scale 2,200 r.p.m. gave us a flat 100 m.p.h.; 2,300 was 109 mp.h.; 2,400 read 112 m.p.h., and a well-trimmed wide-open level flight indicated 120 m.p.h. at 2,525 r.p.h.

Repeating our check-up on vibration by chopping the throttle, we found no deficiency. Nor was there any vibration in hauling the wheel back into a steep climb from cruise. Nor were there any "dead spots." Thrust was good and continually pulling. At different attitudes,

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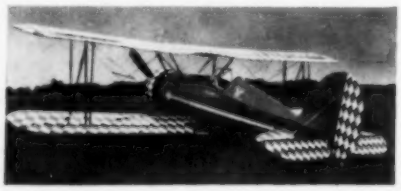
BETTY SKELTON'S NOTEBOOK

Outside-Looper

Aerobatic champ ROD JOCELYN of Langhorne, Pa., has a modified Great Lakes 2T1A which he believes is one of the best aerobatic ships in the country. On his first flight in the *Jocelyn Special*, Rod climbed to 3,000 and did a few rolls and loops. Everything seemed okay so he decided to try an outside loop. The orange and white ship went down and under, quickly building up outside G's. Suddenly one safety belt broke and Rod could feel the other one tearing (he always wears two safety belts). He quickly reefed back on the stick, forcing himself down in the seat and off the belt. When he landed, the mechanics found that less than half a safety belt had kept Rod and the plane from parting company!



Ever since that close call Rod has made a point of checking and double-checking his safety belts. It's easy to understand his concern when you realize that he flies most of his exhibitions at less than 300 feet!

The *Special* is one of the few aerobatic ships that can be outside looped in a 350-foot radius. Here are its spex: span 26 ft. 8 in., length 19 ft. 6 in., height 7 ft. 8 in., gross weight 1,600 pounds, wing loading eight lbs./sq. ft. Powered by a Warner engine (185-200 h.p.), the plane's cruising speed is 100 m.p.h., top speed 140 m.p.h. and stalling speed 45 m.p.h. Its take-off roll is 250 to 300 feet and rate of climb 1,800 f.p.m. at a 40° angle.

Open to Everyone

The 1951 Transcontinental Handicap Air Race will start July 8 in New York and end at noon, July 14, in Los Angeles. This race is open to any person, male or female, holding a valid pilot's license and flying a licensed stock model plane. The race was organized by a group of amateur pilots interested in the race for their own enjoyment as well as for the general promotion of private flying. L. WHITING BABCOCK has established the Babcock Trophy to be awarded the winner and additional prizes are now being solicited. If you're interested, write to the Secretary of the THAR Committee, L. Whiting Babcock, 201 Church St., Wilmington, N. C.

At Last . . .

When Lindbergh made his historic flight 24 years ago MRS. MONA ANN FREEMAN of Tampa, Fla., became interested in aviation. But somehow or other she never got around to making a flight. Then last year she decided she had put it off long enough and—on her 103rd birthday—I took her up. After logging her first full hour in the air, Mrs. Freeman exclaimed, "Why, it didn't hurt me a bit!" In fact she got such a kick out of the flight that she just celebrated her 104th birthday by going up again.

On a recent flight was impressed with the clean operation of the Ritnour Air Service at the Municipal Airport in Lancaster, Pa. GEORGE H. RITNOUR has made his place a real flyers' paradise. . . .

Squirmy

To buzz calm water was Squirmy's wish,
He found much fun in scaring the fish.
The sea was glassy, his judgment bad,
More swimming lessons he should have had.

Betty Skelton

climbs, glides, verticals, there was n shaking.

Before we could taxi to the hangar w stopped, hooked a huge set of scales t the tail, and opened the throttle. Repeated tugging gave a maximum read ing of 330 pounds of static thrust. Thi was an improvement of 15 pounds ove the standard prop.

While we waited for the mechanics t install a metal propeller on the airplane Amanuel related how Dr. Munk and h had developed this propeller. They had originally worked together on a "tail less airplane." It seems that Eli was a graduate student of Dr. Munk's, who is a long-time, famous aeronautical engineeer. Eventually they became more interested in the problem of wooden propellers twisting the wrong way under power.

They constructed several propellers from different formulae but never were able to better the performance of a standard prop. While testing an exceptionally thin section, someone by pure accident noticed that the blade track was moving forward and backward under different throttle settings. This gave them an idea. Why not control this movement and turn it to advantage? After some 10 years of intermittent development, trial and error, their hinge arrangement was perfected—the diagonal laminations were the result.

Performance of Standard Metal Prop

With the standard metal propeller properly installed, tracked, and run-up, we taxied out and again hooked onto the scales. Static thrust registered 350 pounds at 2,090 r.p.m. This was 20 pounds higher than the Flex-O-Prop, and 35 pounds higher than the laminated wood.

With chain measures ready we checked the take-off distance. Back and forth for three tries. The mean average was 500 feet—three feet less than the Flex-O-Prop and 96 feet less than the wood.

Once again we flew out of Erco Field into a steep climb. From standing start we recorded an altitude of 500 feet in 60 seconds. This was 20 feet less than the Flex-O-Prop and the same as the standard make.

From 1,000 to 1,780 feet we used up 60 more seconds. This indicated that the Flex-O-Prop would climb 10 more feet than the metal. Tachometer reading was 2,190 on the metal against 2,150 for Dr. Munk's propeller.

Again we pulled the power off to study vibration. To me it was normal, and the same as standard wood ones. At 1,000 feet we lined the *Ercoupe* up with the course. At 2,100 r.p.m.'s we had a reading of five m.p.h. better than the Flex-O-Prop.; 2,200 r.p.m. was exactly the same; 2,300 read 108 indicated; and 2,400 was 115 m.p.h. As we trimmed up carefully with wide-open engine at 2,500 r.p.m. (wide-open), the airspeed gradually settled on 120 m.p.h., same as the Flex-O-Prop and three m.p.h. faster than the standard wood job. Vibration check-up showed no appreciable difference.

* * *

We had placed a pencil mark on the throttle quadrant at 2,400 r.p.m. when

using the Flex-O-Prop in level flight. With the wooden propeller installed we had raised the throttle to the pencil mark and watched the tachometer settle on 2,300 r.p.m. The strange thing was that the metal propeller's setting was also exactly 2,300 r.p.m. A manifold pressure gauge would have been a handy instrument at this point. The wood propeller registered 98 m.p.h. at the pencil mark, the Flex-O-Prop indicated 112, and the metal propeller 108 m.p.h.

The aerodynamic theory behind the Munk propeller is difficult to explain. It is known that all one-piece wooden propellers, and metal ones also, change their pitch elastically when flight conditions change. A very slight change of pitch can affect performance considerably, and not to the good. This twisting in a normal blade is just the opposite of what should happen.

We all know that for take-off we should have a low pitch for an ideal angle of attack. This results in maximum horse power being developed. For cruise we should have a higher pitch to obtain the same ideal angle of attack.

In a conventional blade the twisting action of the outboard portion tends to do just the opposite of a variable-pitch propeller. But the Flex-O-Prop twists exactly opposite to the conventional blade. It twists toward low pitch for take-off and high pitch for cruise. This is the key to the difference in performance between this and ordinary propellers, according to Dr. Munk's theory.

The physical secret of the Munk propeller lies in the diagonal fibres of the diagonal laminations. The wood fibres, instead of stretching from tip to tip, now run diagonally and provide a hinge effect from the 6-inch station to the 35-inch station (measured from the hub's center).

The deflection of the propeller around this "hinge" causes a change of pitch which is the reverse of that in a normal propeller. Immobile, the tips are bent forward as in the normal design. At idling speeds this is also true. At full throttle under static conditions the thrust developed by the propeller is approximately twice the amount developed at full throttle in flight. The great thrust makes the blade lean still further forward—causing a diminishing pitch.

This speeds the r.p.m. for take-off condition. In the air at full throttle or cruising, the thrust is halved and the centrifugal force increased. This straightens out the blade and increases pitch angle of the blade. Result: improved cruising performance and angle of attack.

I stood out by the wing tip of the *Ercoupe* and sighted down the track of the idling propeller. As the engine began to wind up, the propeller blur at the tip definitely moved forward. As the throttle was pulled back the tip track moved back also.

The manufacturers of the Flex-O-Prop claim the following advantages: (1) performance equal to, or better than any one-piece propeller, wood or metal; (2) smoothness of operation, which is the result of a "dampening" action of the diagonal laminations; (3) lightweight, in weighing 9.8 pounds against 22 pounds in a metal propeller; (4) low-cost—around $80 list; (5) simplicity of installation, and (6) automatic built-in pitch control. It is now available for use on any airplane from 65 to 125 h.p. Plans are in progress to make this type available on up to the 225 h.p. class.

The check that I made on the three propellers is not conclusive, even though the figures agree with those compiled by Tommy Thompson, test pilot at Erco.

The Flex-O-Prop in my mind has less vibration than the others that we flew. There perhaps is a dampening action present but how much I could not ascertain. Its performance, on preliminary appraisal, does seem a step forward. END

FLEX-O-PROP SHOWS EFFICIENT PERFORMANCE

	Wood		Flex-O-Prop		Metal	
Static r.p.m.	1,920		2,060		2,090	
Take-off run	596 feet		503 feet		500 feet	
Altitude from standing start after one minute	500 feet		520 feet		500 feet	
Rate of climb, one minute	700 f.p.m		790 f.p.m.		780 f.p.m.	
	R.P.M.	M.P.H.	R.P.M.	M.P.H.	R.P.M.	M.P.H.
Performance at various throttle settings	2,100	92	2,100	92	2,100	97
	2,200	94	2,200	100	2,200	100
	——	——	2,300	109	——	——
	2,300*	**98**	**2,400***	**112**	**2,300***	**108**
	2,400	105	——	——	2,400	115
	2,550	117	2,525	120	2,500	120

*** While the r.p.m. in these three figures differs, the throttle setting is the same in each case. Note that at this power setting the Flex-O-Prop is turning 100 more r.p.m. than the other two propellers. At 2,300 r.p.m., on the other hand, the Flex-O-Prop has a power setting lower than the other two. Thus the pitch of this particular propeller certainly was smaller, which would have favored climbing conditions over cruise. Even so, with a lower power setting the Flex-O-Prop at 2,300 r.p.m. cruised one m.p.h. faster than the metal prop. Note that it is unfair to compare prop. performance by identical r.p.m. unless power setting is also same.**

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Armchair Pilots

(*Continued from page 34*)

careful pilot flying a properly equipped plane.

Doesn't it cost a lot to learn to fly?

Answer: Yes, flying today is expensive. Even a low-cost operator will charge you $9 to $12 per hour for dual instruction and $6 to $9 for solo. Assuming you will receive your private license after 20 hours of dual and 30 hours of solo, it will cost you $350 to $500. If you join a club, however, the cost can be considerably less. In some cases, clubs charge only $3 to $4 for plane rentals.

After you have your private license you will be able to rent a plane and fly cross-country at will. You can carry any non-paying passenger, or any passenger who shares the expenses of your flying, but you will not be allowed to charge for transportation until you have a commercial license. If you are a businessman, you will probably find that flying pays its own way—and, in many cases, far more than its own way—by saving transportation time. Flying several thousand feet above the terrain at better than 100 m.p.h., you can sneer at the automobiles crawling below on snaky obsolete highways.

Don't you have to go through a lot of red tape to start flying?

Answer: No, the procedure is almost as simple as renting an automobile. Sit down at your telephone and call your nearest airport operator. If you don't know his name look one up in the classified directory. Tell him that you want to learn to fly and make a definite appointment for a fixed hour. He'll assign an instructor to you. There's a minimum of red tape.

But isn't that first flight pretty rough?

Answer: It's a new experience, but not frightening. You may find that it is noisier than you expected. You may be alarmed at the apparently steep angle of bank the instructor assumes in turns. When you first handle the controls in the air you will probably be most concerned with the differences between operating a vehicle in a three-dimensional world where the attitude and position of your plane can be infinite, compared with merely turning an automobile on the flat two-dimensional road or street. But after several hours, you will wonder why you ever thought controlling a plane was difficult.

Frankly, I just don't understand aeronautics. What makes an airplane stay up in the air?

Answer: We're accustomed to think of the air as having neither substance nor weight. But actually the atmosphere over every square foot of the earth's surface is pressing down with a weight of about a ton. The air is a gas—with body, weight and depth. If it wasn't, you couldn't fly in it.

In an airplane, the forward motion of the wing through the air permits the plane to fly. While planes may some day have enough power to permit them to fly straight up (as rocket missiles do today), it is relative speed alone which makes the airplane's wing give lift.

The wing is curved at the top and relatively straight across the bottom. The "lift" comes mostly from the top. How does this happen? The passage of the wing through the air makes the air take a longer path to go over the curved surface of the wing. This creates a lessened pressure—which literally lifts the wing upwards. A little lift does come from the underside of the wing but not very much.

The lift needed to keep a lightplane in the air is less than 20 pounds per square foot and since the air pressure on top of the wing is about 2,000 pounds at sea level, it is readily seen that the lift created is less than one per cent of that potentially available.

But to obtain even this lift, the airplane must have forward motion to make the air speed enough to create the lower pressure on the top portion of the wing. Most lightplanes must travel at least 40 m.p.h. in relation to the air in order to fly. When they go slower they are still generating lift but not enough to keep them in the air. Flying is one form of transportation where, within limits, it is more dangerous to slow down than to go fast.

How do you control an airplane?

Answer: Most lightplanes have three "steering" controls. Two are in the tail section. The horizontal flat hinged surface in the tail is called the elevator. The vertical hinged surface is called the rudder. Small sections of the trailing edge of the wings are hinged to form the ailerons. The ailerons are linked so that when one is raised the other is lowered, and vice versa.

These controls are actuated through stick and foot pedals. The stick actuates the elevators and the ailerons. When the stick is moved backwards, the elevator is tilted upwards, causing the tail of the plane to sink (and the nose to rise); and when the stick is forward the elevator tilts downward, causing the tail to rise (and the nose to sink). A sidewise movement of the stick actuates the ailerons. Movement to the left causes the left aileron to tilt upward and the right to tilt downward. This forces the left wing down and the right wing up.

Planes always bank in order to turn properly. The rudder is operated by foot pedals. Pressure on the left foot pedal turns the rudder to the left, causing the tail to swing toward the right. *On the ground*, the rudder is used like the rudder on a boat to guide the airplane. But *in the air*, the rudder isn't primarily to make the airplane turn but to help it enter into and recover from turns, and to make minor adjustments for directional control. This is a little confusing even to an experienced pilot, and to simplify your thinking about it just imagine the rudder as primarily an aid to making your flying more precise.

You should also think of the throttle as a fourth control. If an airplane is flying along straight and level, more throttle does not give additional speed so much as it makes the airplane climb. Similarly, less throttle causes it to lose altitude.

Aren't stalls and spins pretty dangerous?

Answer: Most novices are properly frightened of stalls and spins. About half of the serious accidents with lightplanes every year have been caused by pilots who stalled their planes into the ground from low altitudes. New stall-proof planes such as the *Helioplane* are already far advanced and may eventually be expected to put a stop to this type of accident altogether. The *Ercoupe* can enter a shallow stall although it is incapable of being spun. Most important modifications to existing planes are stall warning indicators which flash a light and blow a horn when the airplane is near a stall. These have been extremely successful in adding to the safety of fly-

☆ FLAT SPINS ☆

The story is told that the late dictator of Greece, Gen. Georges Metaxas, during an inspection of a Mediterranean air base was invited to try out a new flying boat. He piloted it himself and all went well until his host, the commander, observed that they were about to come down on an airdrome. "Excuse me, general," said the commander, "but it would be better if you landed on the sea—this is a seaplane." "Why, of course, commander, what was I thinking of!" cried Metaxas, as he proceeded to make a perfect landing on the water. Rising from the wheel, he said, "Commander, I greatly appreciate the tact with which you drew my attention to the incredible blunder I nearly made." Whereupon he opened the door and stepped into the sea.

A would-be Air Force recruit was filling out an enlistment form in New York. He hesitated a minute when he came to the question: "Have you or any members of your family ever figured prominently in the news?" Then, confidently, he wrote: "Yes. In 1923 my father went to prison for counterfeiting."

Eating is a tough proposition at high altitudes. The 452nd Light Bomb Wing crews in Korea have found that on high-level missions the sandwiches freeze so stiff they can't bite into them.

You've got to give columnist Walter Lippman credit for being a man who knows his facts. Speaking of General Eisenhower, he recently wrote: "He has to ride many hours on end in an airplane."

A Chicago auto dealer who advertised that he'd pay prospective customers their transportation to his showroom had to dig up $708 for a plane ticket when Bernard J. Menth took him up on it. Menth lives in Sydney, Australia.

In Auckland, New Zealand, a 64-year-old woman enrolled as a student pilot, explaining, "None of my family will teach me to drive a car, so I decided to learn to fly."

U. S. servicemen in Korea were quite unhappy when an Army order stopped the daily ration of one can of beer a day for each man. But the Blatz Brewing Company of Milwaukee, Wis., came to the rescue in fine style—600,000 cans of brew were recently rushed to Korea with the brewer's compliments.

—*Harold Helfer*

ing. It's important to remember that stall-spin accidents happen to careless pilots; the careful pilot doesn't have to fear them.

What causes stalls and spins?

Answer: To best understand stalls and spins, pilots should understand the idea of the *angle of attack*. As an airplane flies normally, the chord of the wing meets the air at a slight angle. (The chord is a theoretical line approximately parallel with the flat under-surface of the wing). This slight angle is called the *angle of attack*. At any given airspeed, the angle of attack determines the amount of lift which the wing will give. As the angle is increased, lift also tends to increase up to a certain point. Beyond that point the air doesn't follow closely the shape of the wing but breaks away and "burbles" or "becomes turbulent." Then lift is destroyed.

At normal speeds, a lightplane's angle of attack ceases to produce additional lift when it exceeds about 20°. If flight continues at that angle the airplane will slow up enough so that the lift is not sufficient to sustain flight. Then the airplane will stall. Stalls generally occur at slow speed but can occur at any speed. In a stall the nose will drop and the airplane will sink until it regains enough speed to fly again.

If an airplane revolves during its descent, the stall becomes a spin. Spins occur when an airplane falls off on a wing and starts to revolve because the "air burbles" on the trailing edge of the wing are so pronounced that the ailerons have no solid air for them to bite into.

Today, all airplanes that are capable of spinning are designed to recover from spins even without the aid of the pilot.

What's that first flight like?

Answer: You will probably learn to fly in a tandem trainer such as a *Cub* J-3 or an Aeronca *Champion*. You'll sit in the back seat and the instructor will explain the throttle and stick and rudder pedals. He will ask you to place your feet lightly on the rudder pedal: to follow through his own movements so you can get the "feel" of the airplane. When he taxies out, he will swing the nose back and forth, to clear his view.

He will take off himself, but once away from the airport he will probably have you actually flying the airplane on your first flight. Even if you are discouraged with your inability to make the plane behave exactly as you want it to, you will be surprised and pleased to note that the airplane does very well by itself—in fact, it wants to do the right thing without any help from the pilot. This is proof again how safe a properly-instructed pilot really can be.

Your instructor probably will let you attempt your own approach for landing on your first flight, and while you won't be landing the plane this time, it won't be long before you do. Within a short while you will learn the airport pattern and how to land and take off with confidence.

Is it hard to land a plane? And what's the pattern?

Answer: No, it's not hard to land. A pattern is the route you fly when leaving or approaching an airport. Most patterns are flown to the left. A typical pattern is to take off down the runway into the wind. Climb to 500 feet and turn left 90°. Level out on your crosswind leg, continue for perhaps half a mile, then turn right 45° and leave the pattern. If you want to continue in the pattern on your crosswind leg, turn left 90° in a climb instead of right 45°. Continue to climb to 800 feet on the downwind leg parallel with the runway. Pull out your carburetor heat. Chop your throttle approximately opposite where you expect to land, go into a glide, losing altitude. Then turn left, crosswind, 90°, clearing your engine once or twice, and then turn into your final approach and glide into the runway with your engine idling. You break your glide just above the runway. The plane floats into a landing—a three-pointer. It's easy. Almost as easy as driving an automobile. END

FLYING

"Shouldn't we release the carrier pigeon now, Mr. Sheridan?"

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A 'Calculated Risk'

(*Continued from page 13*)

immediate and foreseeable future.

The military planners who have sold the President and the Congress on the idea insist the gamble is worthwhile. Their aim is an aircraft industry that can switch into producing the latest type of warplanes almost at the flick of a switch. Meanwhile, a substantial number of new planes will continue to roll off the assembly lines.

For its part, Congress has always been sold on the theory that a healthy industry is the necessary first step toward preparedness in the air. Rep. Carl Hinshaw (R) of California, one of the leading air power spokesmen on Capitol Hill, points to one big advantage of the new plan—the ability to turn out the latest planes rapidly.

Hinshaw told me: "A second best airplane is like a second best poker hand. It seldom wins and can be very expensive."

Today's plane can become obsolescent "almost as fast as yesterday's newspaper," said Congressman Hinshaw. He makes the telling point that the Administration could have gotten on the beam three years ago when costs were considerably lower and the economy less disrupted, if it had seen fit to follow the recommendations of the Congressional Air Policy Board and the Finletter Committee. He deplores the action of the President in impounding the additional aircraft funds Congress tried to get him to spend in 1948 and 1949.

The process by which it is proposed to build up capacity faster than production is fairly simple in its conception; carrying it out is proving more difficult. Essentially it involves a new kind of stretch-out system for the aircraft industry. Technically it is referred to as "overtooling." When a plant receives an order for say 100 planes, it may be required to handle the work in the same way as though it had been told to produce twice that many. This means using more floor space and equipment than necessary—though probably not more labor.

It is all quite the reverse of the normal idea of efficiency. Instead of using one production line to the fullest extent possible for each order, the aim is to activate two or more. In some cases this will involve the premature splitting up of a particular order among separate plants. One illustration is the case of the Fairchild *Packet*. Early this year procurement officials ordered some of the production of the *Packet* shifted to the Willow Run plant of the Kaiser-Frazer Company.

At this stage of the game, however, it is not the Government's intention to make extensive use of the facilities of the automobile industry. It wants to give those already in the field a refresher before turning to outsiders. Except for the work shopped out to the Kaiser-Frazer Company the only other unit in the auto industry awarded an airframe contract under the new program is the Buick-Oldsmobile-Chevrolet plant of General Motors at Kansas City. An order for a number of Republic F-84F *Thunderjets* has been awarded there.

Besides the military risk involved certain other objections are raised to the new procurement plan. For one thing, it is contended that the cost per plane will be much more than under a normal procurement program. No one denies that this is true. Overtooling is bound to cost more. One large aircraft builder says that execution of the plan would mean an extra 90 million dollars added to the cost of filling a contract he holds.

In addition, a stretch-out of the work on such a vast scale will probably require the services of more technicians than are available. Using two production lines where one would do the job does not necessarily involve a large step-up in general employment. But it does develop a crying need for more aeronautical engineers—and the supply of these men is already critically short. It is an old story by now that modern jets are infinitely more complicated than the World War II equipment they are replacing. Obviously the production of such super models makes it necessary to use more technicians.

According to a recent Air Force estimate, one out of every six aircraft workers now has to be an engineer—a much higher ratio than before. As an illustration, the experience of the North American company is cited. This company is employing more engineers than during its world war peak. But its over-all labor force is only half of what it was then.

As advocates of the plan see the picture, however, the fact that a temporary crimp is put in the supply of trained technicians is all the more reason for going ahead with it. They say it is better to have a dry run now and show up the major deficiencies than wait until all-out war to step up the supply of engineers.

As far as the general labor supply is concerned, no immediate problem exists. The industry is still pressing for a more specifically spelled out deferment policy for its highly trained and experienced specialists—something that it is not likely to get due to the congenital fear of Selective Service officials of setting a precedent. Deferment continues to be handled on a personal basis, though by and large the industry is not suffering too much under this system.

In the event of all out production, of course, everything would be changed. Extensive worker training programs would be necessary. Some believe the Government should not wait until the emergency is upon it to help underwrite such training work.

If the dollar yardstick is applied, the industry, with Air Force, Navy and Mutual Defense Assistance Program orders totaling $11,400,000,000 on its books, is enjoying the third best year in its history. This is the way things stacked up for the fiscal year that ended June 30. The only bigger years in volume of expenditures were the war years of 1943 and 1944. The new fiscal year starting July 1 will involve even larger appropriation totals.

And this poses what will probably be the deciding question. Will the President and Congress be able to persevere if the costs of the plan get out of hand? Already such costs are greatly exceeding expectations. Moreover, inflation has taken a healthy bite out of the aircraft dollar. AIA officials say that the costs of some parts and equipment have zoomed up 50 per cent since Korea. END

★ ★ ★

USAF's basic program for expanding the aircraft industry's base, increasing production capacity, was still in effect as this article went to press. Other developments in Washington indicated, however, that a freeze would be imposed upon most combat types of warplanes, enabling the industry to step up production.

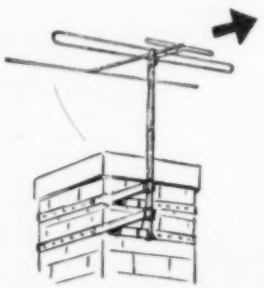
This would not affect the current emphasis upon building production capacity, as reported in this article by Richard Saunders. —ED.

★ FLYING TIP ★

I HAVE found that television antennae on housetops can sometimes be an aid in cross-country navigation. Usually, these antennae are homed on the TV station, and the general direction of the station can be determined simply by noting the direction in which the antenna is facing.

With these aids you can fly directly to the city in which the TV station is located. As you approach the station, of course, the outside antennae will be fewer and fewer because inside antennae are sufficient for good reception. But by this time you should be close enough to the city to see it anyway.

(Incidentally, it's important to remember that not all antennae are homed directly on the station. Sometimes an antenna will point toward a mountain or other nearby object which "reflects" the source of radio waves. So don't bank entirely on this method; use it only to supplement your usual navigation.)



Two types of TV antennae, as they appear from the air, are shown above. Arrows indicate the direction of the station.

—*John D. Pruett*

Got any tips you'd like to pass on to other pilots? Contributions should be typewritten and not over 200 words. Payment will be made at regular rates.

Beech C35 Bonanza

(*Continued from page 25*)

started buffeting. Claude's pants-indicator was sharper than mine and one and one-quarter seconds later he eased the wheel forward and we were cruising.

Flipping a couple of switches, the gear and flaps came down. Claude still had full throttle and there we were, pointing to the angels again. As the airspeed went through 60, the horn went on again and a red light popped on over on the left side. Fifty-five, 50 . . . As the indicator hit 45 m.p.h. she sluffed over on her left wing downwards and I remembered all the manuals I had ever read about spinning with flaps down.

Claude was right on it. My eyes refocused in level flight. Power-off stalls with gear down and 30° flaps were a cinch. At 57 m.p.h. horn and light intruded. Through 52 m.p.h. and at 45 m.p.h. indicated she paid off with no buffeting of the tail.

It was pretty cold up there, so we turned on the cabin heaters and defroster. Claude mentioned the safety campaign they had been waging, and said, "I want to take you through a simulated instrument descent as it might be flown by a pilot who has no instrument ticket."

The clouds were just below us. Item one, slow up to 110 m.p.h. Item two, let gear down, with trim tab up to "U-12." With tachometer at an even 1,100 r.p.m., airspeed indicating 100, don't touch the wheel. As we went into the cloud, Claude repeated, "We use no wheel, but guide the aircraft through the overcast with rudder and gyro compass alone." It was bumpy in the cumulus. Claude held his course and we broke through right-side-up at 5,000.

Pattern work is normal in every respect. With gear and flaps down, prop in "Hi r.p.m." visibility from the C35 is excellent. Airspeeds of 80 to 85 m.p.h. give control without excess speed. A side-slip with that butterfly tail is made exactly the same way as with a conventional tail. We purposely came in high on the sod runway at Beech in a simulated barrier approach.

With the power off, our crimson job lowered her nose and headed for the ground at seemingly full speed. It still indicated 80. As Claude aimed for the big "31" on the runway and started to break the glide I was surprised he made it. The Beech flared for a moment only, then rocked forward onto her nose wheel. With a gusty 20 m.p.h. nose wind, we stopped right now.

After taxiing back to point of take-off again, we decided to try a strong cross-wind take-off. The wind had shifted to west-north-west, 20-30 with strong gusts.

"In a strong crosswind take-off, Ed, you hold the nose wheel down and gain more speed down the runway. At 60 or better, when you break ground, do it quickly, then ease off," Claude said. We broke ground without difficulty, but just as we climbed past the lee side of the Beech factory we smacked full into the rolling ground turbulence. The Beech headed first to the left towards Wichita, then to the right to Rawdon's airport. The airplane took some loads for a few seconds, then we were out in the clear. At the first indication of roughness I slanted my eyes out to the wings. There was never a ripple on top camber.

A crosswind landing is executed by landing on two wheels (crabbing, or lowering a wing as customary) and then slapping the nose wheel to the pavement. The instant your nose wheel hits, you have full control. I have heard that it is difficult to slip or skid with the butterfly tail, but for all practical purposes, I forgot it was on the plane.

From a prosaic view-point the C35 is a four-place, low-wing, cabin, land, all-metal monoplane. It is powered by an E-185-11 Continental engine, rated at 185 h.p. at 2,300 r.p.m., and 205 h.p. at 2,600 r.p.m. A new metal Beech electrically-governed propeller whisks the C35 forward. The airfoil is classified as a 23,000 series wing with a 12 per cent tip and 16.5 per cent root, tapered both ways.

The tricycle landing gear is operated electrically, and is supplemented ("down" only) by a fast-acting emergency hand crank just aft of the co-pilot's chair. The satisfactory A35's steerable nose wheel has been retained throughout the so-called "flying Banana" series. This gear comes down in a hurry.

The color scheme on the plane we flew was a red body with cream trim along trailing edges and cowl top. All the C35's have gotten away from the usual Alclad cover in favor of protective and decorative weather-tested enamels.

I asked one assistant what colors were offered the purchaser. He said, "I think there are about nine basic colors, but there must be around 35 different combinations."

The blind group on the ship I flew was located on the left. All flight and engine instruments were painted with chemicals emitting an orange glow with dull gray back-drop. At night these were lit up by "red" light, sending rays from the front of the radio speaker in top center of the interior.

This shoulder harness deal has been receiving a lot of publicity and since it was pioneered for civilian ships in Wichita I wanted to get the dope on it. Ralph Harmon, staff engineer, had been working with Oklahoma City CAA Aero-Medical Research on another project when they came up with an idea for a new type harness in 1948.

Beech is still working on this project in an attempt to gain 30G's out of an improved harness. However, the harness now in the C35 is excellent.

It is a specially-woven webbing, neatly anchored with bracing at terminals beneath and behind the chair. It crosses behind the occupant's shoulders, over the collar bones, straight down under the arms, through a reinforced loop beside each hip, and each end terminates in a common seat belt.

This means that you can lean forward to rescue your pencil from the floor, or pick up any loose change. Yet if you ever take out a chicken house with your port wing, your body moves forward, first taking the slack out of the hip portion, then clamping down on the shoulders. There are four of these harnesses. I will say that until you get used to them they seem a little awkward. But they're nothing like the rigid belting with which we strap ourselves in the surplus trainers.

About the cabin appointments, as one fellow put it, the factory has worked hard on the "tremendous trifles." Ventilation and heating systems used to be almost non-existent. The fuselage I checked had 15 openings in the cabin to mix hot and cold moving air.

(*Continued on next page*)

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NAVY TOUR

Given worthwhile events, Flying Farmers will take cross-country flights involving great distances. This was demonstrated recently when Flying Farmers from 18 states showed up at the U.S. Naval Air Station, Pensacola, Fla., for a Navy Familiarization Tour. National Flying Farmer officers as well as state FF officials were invited to make the tour which was sponsored by the Flying Farmers of Prairie Farmer Land.

One of the highlights of the trip was the opportunity to watch carrier qualification landings aboard the *U.S.S. Monterey*. The three FF's shown relaxing on the bridge (left to right) are

Col. Clarence Cornish, Indiana director of aeronautics, Fred B. Tripplett, former Texas FF president and national director and E. M. Anderson, vice president of National Flying Farmers.

This was the third such trip sponsored by these FF's. Another is planned for next spring, with a side trip to U.S. Naval Air Station, Jacksonville, Fla. Flying Farmers throughout the nation can get their names "in the pot" by simply sending a post card to this column saying, "I am interested in making the next Pensacola trip."

★ ★ ★

GODFREY SPEAKS UP

We recently asked, "What one thing does private flying need more than anything else?" Here is the reply from well-known Flying Farmer Arthur Godfrey: "In my opinion, it needs an all-metal four-place single-engined airplane that will cruise at least 170 m.p.h.-T.A.S., that will stall out at less than 30 m.p.h., has a rate of climb of 1,200 f.p.m. for the first minute and that will retail for $5,000 complete with a two-way VHF radio and an ADF."

Godfrey continued, "I happen to know from an engineering standpoint that it can be produced, in normal times. It could be so foolproof that anyone who can drive an automobile could learn to fly it. Such a plane could use any 10 to 15 acre pasture as a landing field, and except for 100-hour checks would require no more than superficial mechanical knowledge to keep it in running order."

★ ★ ★

HELP FOR STATE GROUPS

The National Flying Farmers' Association is now in a much better position to give aid and encouragement to the various state organizations. Two recent moves make this possible—the appointment of Del Fuhriman (Utah) as full-time field secretary and the donation of a new *Tri-Pacer* by Piper for the field secretary's use.

★ ★ ★

GOING TO TOWN

W. C. Tanner of Geraldine, Mont., contends that airplanes will be just as useful to western ranchers as tractors or saddle horses when two things are done. No. 1 need, he says, is bus service to and from airport. Tanner's second requisite is lighted runways at small town and ranch airports.

This columnist has often wondered why city dads usually turn the busses around only two or three blocks from the airport. On recent trips we have found taxi fares average $1.50 from airport to town (round trip $3 as against about 30-cent bus fare). Taxi fares are one of those things that discourage folks of moderate means from keeping airplanes.

And we often wondered why operators don't keep a bus schedule in those instances where city transportation is available. Many's the time we've inquired, "When's the next bus?" only to find that the airport attendant didn't know.

In Florence, Ala. (Muscle Shoals), the transportation-to-town problem has been solved as far as flying farmers are concerned by the owner of the Reeder Hotel. Flying farmers stopping overnight simply call the hotel and a car is sent for them. And as you would expect, this extra service is paying dividends.

★ ★ ★

LETTER FROM AUSTRALIA

Norman B. Draeger, writing from Melbourne, Australia, expresses an interest in organizing a Flying Farmer chapter in the "down under land." Draeger says that farmers who own planes in Australia have been left to their own resources, and that the government hasn't done much to encourage private flying. He concluded with this statement, "I must hand it to you Americans for scientific control of your troubles."

What do other Australian flying farmers who read FLYING think about getting an organization going?

Defrosters, stale air vents, etc., are standard equipment, and even a complete and working air conditioner can be had for some extra 1951 dollars. For taxiing comfort on hot days both rear windows open on hinges some four inches wide.

Among the other unusual items are individual sun visors. Did you ever fly west into a setting sun? There's a rod for coat hangers with a zipper shelf opening into the luggage compartment. You can either let your coats droop into the luggage or, if Junior gets obnoxious, you can ease him down behind the rear seat and let him explore the cubes in the 16.5 cubic foot capacity compartment. The ignition key fits the baggage door so there's no danger of him bailing out over mid-ocean.

That "butterfly" tail has come in for a lot of discussion. When the first Model 35 made its appearance, lots of know-it-all pilots were sure that the tail would create a lot of instability. M. J. (Jerry) Gordon, the chief aerodynamicist, had a lot to say concerning this creation.

"Ed, the 'V' tail was first used in Poland in 1932. Superficially it would appear that you should save a third of weight, tail area, and drag by using two tail planes instead of three."

"Was this percentage saved on the *Bonanza*?" I queried.

"No, but we did save about 25 per cent in weight, and a third in area and drag. Obviously this added up to additional speed and cleanness of design."

He continued, "Believe it or not, when we designed the Beech *Mentor*, which is a conventional empennage, we simply laid the *Bonanza's* tail planes down almost flat and added a vertical tail plane.

"It's those tremendous trifles, such as the 'ruddervators' (as someone dubbed them), the sealing of the gaps between the chords and control surfaces, the retracting of the step, flush riveting, the submerging of brackets, control hinges, balance weights. These contribute to a 'clean' aircraft.

"Take the 1951 Beech, for instance. On this we concentrated on better stall characteristics. With immeasurable trial and effort we found that a simple leading edge fillet at the wing root contributed substantially to the stability of the stall."

Beech has come up with these new performance features on the 1951 *Bonanza*: Cruising speed has been boosted to 175 m.p.h., with a top of 190. Range has been increased to 775 miles. Take-off horsepower has been upped to 205 from a previous 196.

In regard to physical features, Beech has added the unique leading edge fillet, a novel set of "Hi-strength" safety harness, a larger tail chord (20 per cent more), a positive door lock that won't pop open, and increased seat structure strength for the shoulder harness. Controlled heat and ventilation, reclining seats, eye comfort, all show directed thought. Noise level has been reduced to an almost minimum.

It is difficult to find any particular defects in this airplane. About all of the criticisms mentioned in previous check pilot articles (see FLYING, September

1950) have been remedied. A locking door handle makes it impossible to pop the door in flight without releasing a small safety catch. There is still a little cramp on extended flights for the long-legged fellow in the rear. The yawing tendency is still present in slight amounts in turns but the larger area of tail seems to have corrected 95 per cent of previous complaints.

BEECH C35 BONANZA
(Type Certificate No. 777)

	Continental
Engine	E-185-11
Wingspan	32 ft. 10 in.
Length	25 ft. 2 in.
Height	6 ft. 6¼ in.
Gross weight	2,700 lbs.
Empty weight	1,625 lbs.
Useful load	1,075 lbs.
Available weight with full tanks	822 lbs.
Wing area	177.6 sq. ft.
Wing loading at gross weight (per sq. ft.)	15.2 lbs.
Power loading at gross weight (per h.p.)	14. 6 lbs.
Take-off run (20° flaps, S.L., 10 m.p.h. wind)	525 ft.
Landing run (30° flaps, S.L., 10 m.p.h. wind)	227 ft.
Maximum cruise at 120 h.p. (8,000 feet)	175 m.p.h.
Landing speed with flaps	55 m.p.h.
Rate of climb (sea level)	1,100 f.p.m.
Service ceiling	18,000 ft.
Fuel economy at max. range (per U. S. gal.)	19.9 miles
Maximum baggage	270 lbs.

Source: Beech Aircraft Corp., Wichita, Kan.

I watched two ladies ascend the wing, and they were able to get to the door with retention of feminine dignity. But they, as I, fumbled the ball when descending into the depths of the cabin. The floor is similar to that of the new Hudson auto, only here you can't sit and slide your legs in. You enter the interior by putting your left hand on the slick fuselage, the right on the opened door, and sort of gravitate in. If a lady's left hand slips she's in trouble. A spring-loaded flush handle would cure this. If the lady has on slacks, she can make it without much trouble.

The Scout compass performed nicely in this airplane. However, I have seen lots of these small compasses behave badly and they should be used with a gyro to keep them on course. I wouldn't want to start out across the Alleghenies after dark in this fine $12,990 airplane dependent only on this.

Now, what is the outlook for civilian manufacture? Jack Gaty, vice president and general manager, says: "We intend to continue building airplanes for executives as long as we can get materials and components. It is our opinion that such airplanes constitute an invaluable asset, whatever the course of the cold war or hot war."

END

English Flying Club

(*Continued from page 29*)

there were two approaches to the license. The Ministry will arrange for the tests or, alternately, they may be taken before a Royal Aero Club observer. The Club then issues an Aviator's Certificate recognized by the *Federation Aeronautique Internationale* and acceptable to the authorities as evidence of qualification for a private license.

Preparing for the examination on regulations and flight rules was not difficult. There has been much standardization between our countries because of the work of ICAO. Fortunately, too, the left hand drive rule is abandoned once you enter an airport. As a matter of fact, the flight rules are more simply expressed than are our own. About everything the private pilot will need is contained in the Air Navigation Act of 1949, which appears in an official pamphlet of some 100 pages.

There are some differences in flight regulations, of course. For example, to fly after dark a night rating is required. Instruction requirements for this rating include five hours of night flying and five hours on instruments. There is also a towing rating. Pilots of 35 and over will find that their medical is good for only one year.

Here is one important flight rule that I had never encountered before:

"An aircraft, which is flying within the United Kingdom in sight of the ground and following a line of landmarks (such as a road, railway, canal or coast line), shall keep such line of landmarks at least 300 yards on its left, and shall not fly keeping on its right such line of landmarks except at a sufficient distance therefrom to avail other aircraft which may be following the line in accordance with the Rule."

At first I questioned the need for such a rule; later when I started flying I found that the railroads, coastlines and rivers were principal navigational aids for private flying, but more of that later.

To offset the simplicity of their flight rules, the British have adopted a complicated system of aerodrome regulations. In many ways they are helpful, for much information can be drawn from the signals area located on each field. For example, a yellow pyramid is hoisted to show an instrument approach in progress; two red balls mean that gliding is taking place; and a dumbbell sign is displayed to indicate that landings are to be made on the runways. A red and yellow checkered flag shows that the field is under Ministry control and the landing pilot must report.

Since I was to be flying cross country I was anxious to check charts, the weather and radio facilities. The prospects on all counts were a little disappointing. From the first I had been suspicious of English weather. Only frequent rain could induce the national habit of carrying umbrellas and the forecasts appearing in the daily papers were not encouraging. A typical forecast often included the phrase, "sunny periods"; better ones might say, "drizzly periods."

London, I found in checking statistics, is situated in one of the drier regions of the British Isles. Its annual rainfall is, for instance, less than that of New York. Even so, it rains an average of 165 days

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out of the year. Along the west coast and northward into Scotland the annual rain days increase to something over 200. These rain conditions, plus occasional fogs, including sea fog, give weather a prominent place in any flight plan. Frequent in-flight checks are far more necessary than in the U. S.

Up until early last year a daily service known as "Airmet" provided aeronautical weather reports continuously on 248 kc/s. Although British pilots have petitioned for the return of this service, the latest indications are that "Airmet" will not return to the air.

Because of the possibility of sudden deterioration in the weather, one field in southern England maintains FIDO facilities on a round-the-clock, standby basis. Use of this fog dispersal installation is free in genuine emergencies. To impress the pilot that its use is contemplated only in circumstances which cannot be foreseen, the Ministry warns that the fuel charges will be billed in any case where its necessity can be traced to unsound planning or poor airmanship. Since it costs the equivalent of about $1,400 to warm up the installation and $700 for every minute of operation thereafter, its proper use is pretty well assured by the pay-up-if-careless regulation.

As you would expect in such a highly developed and compact area, the coverage of radio facilities and navigational aids is good. Several systems overlap and the pilot with the right equipment is well off indeed. To enjoy two-way communications, the pilot needs VHF. With it he can maintain contact, get special weather reports, and use the ground D. F. stations which he can call on for bearings and even position reports. Letdowns can also be made by using a series of bearings from these stations. Unfortunately, however, very few private planes and almost none of the club planes available for hire are equipped with a radio of any kind.

The first thing I noticed about British charts was that they are not charts at all but Ordnance Survey maps. The one most in use by private flyers is the quarter-inch (four miles to the inch). It is fine for motoring but the detail is bewildering from the air. On the other hand, prominent features which can be seen for miles from the air just aren't recorded. Exceptions to this are the race tracks or race courses (they are marked R.C. on the maps). In fact, the overprinted race courses and aerodrome locations comprise the only aeronautical information appearing on the quarter-inch map. Coming into use are ICAO charts to the same scale as our own Sectional and World Aeronautical charts. Up to the present time, however, these show but little in the way of aeronautical data; even the race courses have been omitted. A new edition has been promised, however, and at least a start has been made in the right direction. Since hazardous areas and radio facilities, for instance, do not appear on them, you find yourself drawing in all the information you've come to expect on the U.S. maps. This helps but, on the quarter-inch, also adds tremendously to the confusion of detail in the chart.

William Hampton, chief flight instructor of the Surrey Flying Club, defends the British maps, maintaining that a lot of detail is essential for map reading in Britain.

"Map reading is difficult to learn in this country," he says. "The reason for that is that the country is so built up. Villages and roads are crossed so often that they become confusing unless you make positive identification. To do this properly, you need a detailed map. When you come to a village it's no good to say, 'That looks like Woking,' and fly on. The chances are it's Dorking or some place else. The only safe thing to do is to get out the map, check it carefully and find out what it really is."

While I can't honestly go all the way with Mr. Hampton, there is something in what he says. Once in the air you are confronted with far too many landmarks. Roads, railroads and villages are, naturally enough, as profuse on the ground as on the map. The complete lack of air markers doesn't help, and D. R. navigation, with occasional check points, is difficult when almost all check points look alike and you can't find the few outstandingly prominent ones on your chart. Also, it was necessary for me to change my system of map reading. It's no use to locate objects on the ground and then try to find them on the map. The only profitable system with British maps is to study the map and try to make it fit the ground.

With uncertain winds aloft, hard-to-read charts and no radio, it's small wonder that some private pilots steer by the road net going their way. Hence the rule I quoted earlier about keeping to the right of steering lanes. In fairness, I must say that the more experienced pilots have the usual disdain for this system of getting around and you will find navigational skill developed to a high degree over here.

The Surrey Flying Club is one of the few favoring American equipment. British planes are usually preferred. Still a favorite is the *Tiger Moth* in which many of the RAF learned to fly. It is a well-mannered open cockpit biplane, powered with the 130-h.p. *Gipsy* engine. The American pilot notices only one difference in flying British planes. The prop rotates counter to those with American engines. The resulting torque is a little puzzling on take-off unless you are prepared for it; and, of course, propping is somewhat awkward at first.

Flying costs in England are just about on a par with U.S. rates. The hourly charge slices up differently, however. More of the English charge goes for gas and parts, while less is allotted to labor. Landing fees are a standard 70 cents (present equivalent). Hangarage fees are also standard. Since the latter are computed on a square foot basis, some of the lighter planes cost more to hangar than do heavier ones. For example, a Piper *Super Cruiser* figures out to about $23.00 per month, while the heavier Fairchild *Argus*, despite the fact that it's a larger plane, comes to only $17.00.

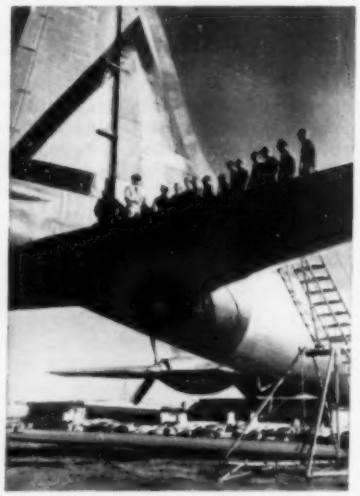
Britain is very air-conscious; thousands of its citizens would like to fly. Those who can do so have gone into the flying clubs, others have chosen the more inexpensive gliding, still others enjoy flying only vicariously. But all of them lend support to private aviation. In spite of this, there were only 480 private planes registered in 1949. This represents a body of flyers too small to effectively demand faster private planes, cheaper radios and better charts. The truth is that in postwar Britain private flying is a luxury that few can afford. These facts by no means reflect a lack of progress in the other branches of aviation throughout the British Isles.

If there are any deficiencies in his aids, it bothers the British private pilot not at all for he regards flying merely as a sport; and it's a much more exacting exercise to make that holiday flight without radio. This brings me to the role of British private aviation. In the United States, the personal plane has long since been put to work. In the British Isles, with short distance and a high density of transportation facilities, the small plane has little place in business or the transportation picture. Here you will find flying for flying's sake and the airplane enjoyed as an airplane.

To add to the pleasure of flying in Britain, the Ministry officials and employees are both friendly and helpful. In addition to the camaraderie found among flyers anywhere, the British flying clubs provide something not found in our own less social variety.

If you do visit Britain, you should plan to do some flying of your own. There is much to see; many new places to visit; and remember, this is a good place to base an air tour of continental Europe.

END



DID YOU KNOW?

(See page 47)

The 13 men are standing on the horizontal stabilizer of a B-36 at the Air Force's Airplane and Engine Mechanics School at Sheppard Air Force Base, Texas.

Stop That Stall

(*Continued from page 33*)

claim cousinship with the older method.

The second departure from usual stall recovery is in the recommendation that the ailerons be used, carefully. No longer are the ailerons forbidden controls in stall recoveries.

CAA cautions pilots to experiment with their own planes and their individual piloting ability at safe altitudes. Dr. Rulon points out that only one type of plane was used and that it was flown by experienced CAA pilots.

A few misinterpretations have been made of the study. Pilots have bundled all of the three separate recoveries into one. Some remark, "Why you just plunk the nose on the horizon and wobble out of it." This is pretty close to fact but remember the two exceptions, steep turns and stalls with no power, both of which require dropping the nose below the horizon.

The basic theory is founded on the relation between power available and drag.

Modern planes with their extra power, efficient wings, and good aileron control at low speeds often can overcome drag with power. But in order to recover when drag does exceed power (due to a severe and complete stall, heavy load, gear or flaps down, etc.), the plane must be nosed down "below the glide path" to add the force of gravity to the power of the engine and so overcome drag.

In steep turns, where a great deal of drag (due to high wing loading) is present, the recovery again necessitates a "below path" nose position. Stalls from steep turns earned an added caution of, "*do not attempt to continue the turn.*"

New recovery methods are not the quickest way to get out of a stall but they are the most altitude-conserving methods. It may take an agonizingly long time to effect the "on horizon" recovery and require extremely careful handling of the controls yet by using the new methods loss of altitude can be cut down by as much as two-thirds!

Questions that had puzzled the writer for years were cleared up when the results of the CAA research were published. Why, I had often asked myself, were some students able to recover from a stall with less loss of altitude than I did when they recovered the "wrong way?" I shudder to think of the obedient trainees who changed over to my method —"dumping" the nose below the horizon. They lost more altitude—but they passed the flight test!

I remember one student vividly. One afternoon he made an extremely high, very fast approach in a PT-19. Though it took real talent to overshoot all that runway he managed to do it. Most of the strip had passed beneath him before he hit the throttle, dragged the wobbling ship up over some power lines, missed them by the skin of his teeth—and then promptly dumped flaps!

We groaned as we watched. I mentally chalked up a statistic under "stall fatalities." The ship shuddered and sank. The "proper" thing for the student to do now was to push his nose down and "recover" from his stall. As it was, we saw him scraping treetops with no room even to try the proper method! Instead, he obeyed sheer instinct and roared and sagged along, nose on the horizon, everything wrong that could be wrong.

With tortuous slowness the ship lumbered out of its stall! We scarcely believed our eyes.

When he brought the ship around again he managed to scorch onto the runway and merely roll off the end into a ditch. His horrified wife hardly let her feet touch the ground as she ran to the airplane. Her hero came wobbling out, knees collapsing. And so the incident ended.

But somehow I could not forget it. I couldn't understand why the boy hadn't cracked up using such unorthodox recovery methods. But, as always, when knowledge is scientifically proven, it appears obvious.

The plane used for the CAA research was the familiar Piper J-3. Every effort was taken to guarantee that all of the instruments were accurate and reliable.

Special equipment included a radio altimeter. All tests were flown at less than 1,000 feet. To check calibration of the radio altimeter a sensitive altimeter was also installed.

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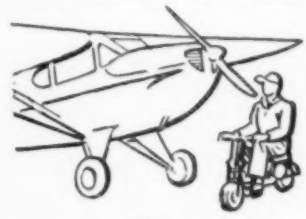

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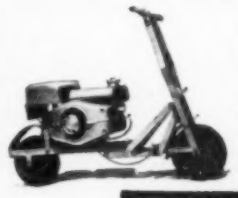

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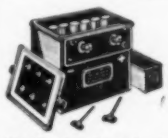

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completed the extra equipment. The airspeed must have been fun to watch, for "some stalls occurred as low as 28 m.p.h.," Dr. Rulon said.

Stalls were tested out of 11 separate flight maneuvers, using 15 different recovery techniques for each, and with 10 acceptable trials necessary on each of these! Thousands of stalls were flown in the five months required to make the study. If, through some pilot or observer error, the stall did not meet the standards set, the two patient test pilots had to do it again and again until it reached specifications.

Preparations for the test were thorough. Everything was taken into consideration: just what to look for, exactly how the maneuvers were to be flown and measured, how to time the stall, and how to record the loss of altitude and the recovery method used.

Both occupants of the plane were experienced CAA pilots. They alternated duties about every half hour to reduce fatigue and to keep individual flying habits from affecting the results. Since CAA wanted records set down to the split second of time and single foot of altitude, several hours of practice were needed by the observer-pilot team to learn to record all of the information quickly on their clip board charts.

Turbulence often made records inaccurate and most of the flying was done in early morning hours and in the late afternoon on calm days.

About a third of the tests were flown over a relatively quiet bay, sheltered from the open ocean by a beach off Boston Harbor. The remaining flights were done over lakes or flooded lowlands near Bedford AFB, Mass. By flying over water the pilots obtained a flat surface, which resulted in extremely accurate altitude measurement with the radio altimeter. Most tests were conducted from an altitude of 400 to 700 feet.

The test pilots experimented gingerly at first with the "on the horizon" recovery. When the scientists insisted, they tried a few—at 1,000 feet.

One of the men was skeptical. "I don't think it will recover that way," he said. "Why bother with such an impractical recovery at all?"

"Well I don't know now," the other said. "We were taught in the Air Force to recover that way with certain multi-engined planes."

The doubting pilot was soon convinced.

One strong point in favor of the "nose on horizon" method is that it avoids an excessive build-up of speed. Speed build-up usually occurs in the below-horizon recovery, creating excess speed which makes it difficult for a pilot to pull out to straight and level flight without loading the plane down and precipitating a secondary stall.

The test pilots reported that stalls from a glide appeared to be the most dangerous of all and that such stalls gave little warning. Both pilots agreed that a stall from a straight-ahead glide gave the least warning of any.

For stalls occurring from straight ahead flight with cruising power, the best recovery was to add full power, use rudder and elevator as smoothly and effectively as possible, and hold the nose on the horizon until full control was regained. The pilots learned that about the worst thing they could do with this type of stall was to put on full power and "dump" the nose below the horizon—which has been the traditional method.

All kinds of stalls from turns were tested exhaustively. Stalls from left turns consistently cost more in altitude. Steep turn stalls proved to be vicious and unpredictable. Wild and weird gyrations resulted from any attempt to use the "on horizon" method. This steep turn stall resisted the new method completely. "Avoid the stall" the report comments dryly, "It is going to be difficult to recover from it. But if the pilot does stall, he should use all controls to effect recovery." And, it further warns, "do not attempt to continue turning."

Steep turn stalls and stalls without power usually tend to flop the nose below the horizon anyway, so the below-horizon recovery is quite natural in those cases.

The new stall recovery methods require even more care and patience than the old methods. But though they lose time in effecting recovery, they save something far more precious—altitude and lives. END

The Mail Box

(*Continued from page* 42)

fered from maintenance problems and the problem of control stick vibration and rotor roughness. The XR-3's rotor mounting was changed in order to improve the piloting qualities.

Top speed of the XR-3, powered with a 225-h.p. Jacobs engine, is about 106 m.p.h.

HOWARD LEVY

Brooklyn, N. Y.

TIP FOR NOVICE PILOTS

One Sunday afternoon I rented a J-3 *Cub* for a short spin. I was in the air about 15 minutes practicing turns when I noticed that the power seemed to be steadily decreasing. Eyeing the tachometer, I pushed her back up to cruising and waited. The power again began to drop. I put on the carburetor heat and tried it again. Again the power fell off. Since oil pressure was normal, there was no icing, and the engine was running smoothly, I quit trying to figure out the trouble and turned back toward the field. All this time I was continuously edging up the throttle to hold cruising r.p.m.

Then an idea dawned on me. I took my thumb and jammed it down solidly into the throttle quadrant right behind the throttle. The needle on the tachometer then stayed in one spot as if it were glued there. The rest of my flight went off perfectly. The engine vibrations had worked the throttle back.

Perhaps this solution is elementary to an experienced pilot, but it may be of some value to other novice flyers like myself.

LEONARD M. LIGHT

Cedarhurst, N. Y.

SWISS COUNTERPART

The Navy's new Douglas XF4D [bottom] looks like a souped-up version of the Swiss N-20 tailless research glider [top] that appeared in FLYING about a year ago [July, 1950].

JOHN H. POOLE, JR.

Raleigh, N. C.

WHY FILE A FLIGHT PLAN?

I recently asked Chief Aircraft Communicator Willis Bruce of Savannah Radio (CAA), why I should file a flight plan. His reply is worth passing on:

"The main reason, of course, is safety. In 1948, 4,400 pilots found themselves in need of emergency assistance. In 1949, this number dropped to 571. CAA believes this decrease resulted from the increasing use of CAA in-flight and preflight services. The best way to get these services is by filing a flight plan.

"In addition to search and rescue facilities, you get another advantage with a flight plan which lessens the already small chance for your ever needing search and rescue. That other advantage is that the CAA communicator will furnish you pertinent factual information about your present and forecasted enroute and destination weather, winds aloft, icing and turbulence reports, minimum altitudes, terrain information, field conditions at your destination, condition of radio aids which you may use, danger areas, and other facts.

"Also, if you request it beforehand, the communicator will get you a 'tailor-made' enroute forecast from a Flight Advisory Weather Service unit. This forecast will be based on your air speed and proposed departure time.

"It's easy to file a flight plan. Just visit or call the nearest CAA radio station and furnish a few items of essential information and we'll do the rest."

ROBERT SIMPSON

Macon, Ga.

Learned About . . .

(*Continued from page* 38)

was too close to chop the engine. If I had, it would have put us squarely into the fence. The L-4 surged a couple of times, staggering along, and all the while the ground kept going by faster and faster.

I let the nose down a little but it didn't help. The engine was still roaring with maximum power. Finally, I put the nose into the position that experience showed gave the best climbing performance. Then I hoped for the best.

We seemed to climb a fraction, then sink a fraction. The fence was coming up fast. I lined up for a space between the posts.

The right ski slid just under the top strand of the woven wire fence. Then the fireworks began. The nose lurched down and to the right, with me holding back on the stick and kicking left rudder and leaving the throttle wide.

We had hit the east-west fence near its intersection with a north-south fence. The fence our ski caught spun us around to the right and through the north-south fence sideways. Our left side went through first, then the nose. The right gear was pulled out from under us and we let down on the belly in a tangled mass of wire and wreckage, pointing southeast.

I cut the throttle just before hitting the second fence, as that is where the prop wound off and the engine started to run away. I believe that keeping the prop thrust on to the last is the only thing that kept us from somersaulting.

When we came to a stop and the snow and dirt had settled, we crawled out for a look around. The first thing we noticed, and very clearly, was that *the wind was now out of the south at about 35 m.p.h.!*

Damage to the plane was not too bad, all things considered. The right landing gear shock strut was broken, the right wing shattered at the outboard end and the spars cracked at both the strut fitting and root fittings, the left lower longeron was broken in the second bay aft of the cabin, and the propeller was broken.

But the wind change! We were dumbfounded. We went back and measured the ski tracks from the point of starting our run to the point of take-off. They measured just 370 feet. We could never have taken off in that distance, despite the cold air, if the wind had not held steady from the northwest up to that point.

Therefore the wind must have practically reversed itself in the 1,100 feet between our point of take-off and the disastrous fence. In fact, it must have held steady during the time it took us to climb to 20 feet.

Evidently the combination of the time it required for the wind to shift gears was just a little faster than the airplane could *accelerate*. In the few seconds it took us to sink 15 feet, the wind was accelerating a few miles per hour faster than we were.

I've done some very elementary arithmetic to try to discover exactly what happened.

Of course, I don't know the exact strength of the gust at the time of the wind shift, and probably it was less than the 35 m.p.h. we found after the crash, but it is the only available figure and I would like to use it in this simple problem. Also, I'm going to ignore the cross-wind component of our northwest wind at take-off and assume that it was 15 m.p.h. on the nose.

Making these assumptions, we find that the wind changed 15 m.p.h. for the head wind plus 35 m.p.h. for the tail wind—or a total of 50 m.p.h.

When the plane started to climb, airspeed was approximately 60 m.p.h. By subtracting the headwind of 15 m.p.h., we get a ground speed of 45 m.p.h. Since the wind shift suddenly brought up a tail wind of 35 m.p.h., we are left with an airspeed of only 10 m.p.h.

Of course, that is quite impossible because the plane would have stalled out instantly, whereas the history of the flight and subsequent crash shows clearly that it was flying only on the edge of a stall.

How to account for this discrepancy?

The answer is quite clear and logical. The wind shift was not instantaneous. Though it was extremely rapid it must have taken place over a period of seconds. Probably a mathematician, working with the known stalling speed of the L-4, rather heavily loaded, under the temperature and altitude conditions

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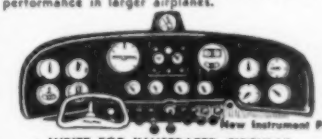

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(3,000 feet) could figure it out pretty accurately. But it isn't necessary to have it too accurate to prove to me that we landed in the fence.

From a practical flying viewpoint, what it amounts to is that from the time the change started and the plane started to sink, until the time the plane was able to maintain altitude again—in our case 15 feet lower than before—should be approximately the same amount of time that it takes to accelerate a plane from 10 m.p.h. to 50 m.p.h. during take-off.

The wind shift must have changed direction and velocity faster than this same period of time or we wouldn't have started to sink. From the first second the wind started its change the airplane was continuing its acceleration. Both the wind change and the acceleration of the plane continued at slightly different rates throughout the change. The wind arrived at its new figure a couple of jumps ahead of the airplane. Since all my calculations are based on estimates, except those of the actual wind speed, I don't know how much the plane was below a safe flying speed.

But it is clear that it was put into a dangerous situation through no fault either of the plane, its engine, or (it seems to me) the pilot.

Thus my own misfortune has proved conclusively that a sudden tail wind accelerating faster than the acceleration available from the plane's engine can have disastrous consequences. How disastrous depends on how much faster the tail wind is able to accelerate.

The lesson is especially important in landing, and emphasizes the desirability of maintaining a gliding angle sufficient to give extra landing speed in case of a sudden wind shift. I have seen two planes wash out their landing gears and lower wings as a result of landing through a whirlwind.

I have discussed this analysis in detail not only because the facts were impressed upon me so deeply, but because the whole affair directly proves Hy Sheridan's thesis in his article "A Lesson in Relativity," [March 1949 FLYING] which started such a controversial barrage of letters. If there are still any unconvinced pilots, I say their case is hopeless. As for me, I learned about flying from that. END

99 Crashes

(*Continued from page 27*)

object at stalling speed on one occasion and found it too dangerous. Thereafter he glided into the target. By gliding into it, the weight of the engine acted as a shield when the plane crashed, and debris usually fell harmlessly about the plane.

At Clinton Airport in Knoxville, Tenn., newsreel cameramen, photographers and reporters from various parts of the nation flocked to cover one of his shows. He took off three times in one of his planes —and landed three times without crashing. Finally, he claimed his plane just wouldn't gain enough altitude to perform the act.

The angry crowd burned the airplane.

A few days later, Frakes climbed into the cockpit of an old crate at Anderson, Ind. As a large crowd watched, he dived toward the crash site. But something happened. A rudder jammed and Frakes couldn't pull out of a flat spin. The ancient plane smashed into a clump of trees and shattered. For the first time the stunt pilot was hurt. He was rescued from the wrecked plane and hospitalized for a wrenched back and sprained ankles. And the crowd was happy!

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In October of that same year he splashed an airplane into a lake in Atlanta, Ga. It was his only attempt to crash into water. "Too dangerous," he said.

Probably the closest call in his stunt crashes was at the State Fair in Oklahoma City on September 29, 1937. He dived into a wooden building which burst into flame. The plane emerged from the opposite side and smashed into the ground. Thousands gasped as they saw Frakes surrounded by flames, struggling desperately to free himself while firemen loosed a stream of water in his direction. Frakes finally extricated himself and ran from the wreckage, his shirt and pants ablaze and one shoe missing. His foot had been caught in the plane. Once again he was hospitalized, with burns on his right hand and elbow, left arm and back.

So certain was he Frakes had been killed in this crash, that W. W. Barkkoff, a pilot who had been taking aerial photos of the event, flew back to the airport and phoned the Daily Oklahoman, offering them the last pictures of Frakes before his death. The newspaper surprised Barkkoff with the information that Frakes was not only alive but that he had signed for a repeat performance!

Always seeking something "new," Frakes tried an almost unheard-of stunt at Great Falls, S. D., in August, 1938. He was slated to collide head-on—in mid-air—with a plane piloted by John Jabo. But in a steep turn during the act's preliminaries, Frakes' Waco buckled and broke in two at about 100 feet. Amazingly, he was not seriously injured.

In Buffalo, N. Y., he proposed taking a dog along as a passenger during a crash. The Society for the Prevention of Cruelty to Animals intervened, implying that a flight with Frakes shouldn't even happen to a dog.

For each act he used a different plane, usually one damaged beyond repair. He bought the planes somewhere near the performance site, paying anywhere from $500 to $1,000 (the expense covered by his contract). Among planes he crashed were *Swallows*, *Travelaires*, *Jennies*, *Wacos*, DeHavillands, *Gypsy Moths* and *Stearmans*.

Of the 98 planes he crashed in acts, all were total wrecks. But he had his closest call with death in an automobile! Near Detroit in 1937 he bounced over railroad tracks just ahead of a freight train and received minor injuries from the bounce.

Payment for his crashes ranged from $1,000 to $3,000. Occasionally he contracted for a gate percentage and made up to $7,000 per show.

Frakes' 99th crackup occurred without an audience. His controls locked on landing near Columbia, Tenn., and he nosed up—without injury.

A tall, broad-shouldered Tennessean, Frakes says he will do anything that is original or unusual. He claims to have originated the stunt of crashing a vehicle through a burning wall. He received a patent in the early 1930's for a combination automobile-airplane but gave up the plan when he had the prototype 70 per cent completed. He built the first wings for the "Human Bat," the late Clem Sohn. And during the war he offered himself to the British as a one-man bombing mission to "get Hitler." He was refused.

He now lives in Columbia, Tenn., not too far from his birthplace in Sumner County, "two miles from Rabbittown down Willow Branch in Happy Hollow on the side of Kill Buck Knob." At Christmas he portrays Santa Claus in parades and once, while garbed as Saint Nick, he waved to the kiddies from an airplane buzzing the main street of Columbia. He can be spotted a mile away, even when he's not dressed as Santa Claus, because of his hat. The rim is bent downward both in front and back, giving a unique conical shape.

But today, Frakes is through crashing airplanes. When he decided to give up his plane-crashing career, he wrote in his scrapbook:

"Now that I feel I have done my part, I am going to take it easy and live to tell my grandchildren of the foolish things I have done."

So today, he has settled down to the occupation of blowing himself up in a casket. He climbs into a casket with five sticks of dynamite. Then he ignites the dynamite by battery and the coffin is blown to bits. This is the tame and quiet retirement of the man who walked away from 99 crashes! END